CABLE TELEVISION: A HANDBOOK FOR DECISIONMAKING

PREPARED FOR THE NATIONAL SCIENCE FOUNDATION

WALTER S. BAER

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Rand
SANTA MONICA, CA 90406
CABLE TELEVISION RESEARCH AT RAND

The Rand Corporation began its research on cable television issues in 1969, under grants from the Ford Foundation and the John and Mary R. Markle Foundation. The central interest at that time was federal regulatory policy, still in its formative stages. Rand published more than a dozen reports related to that subject over the next three years. This phase of Rand’s concern ended in February 1972, when the Federal Communications Commission issued its Cable Television Report and Order.

The Report and Order marked the end of a virtual freeze on cable development in the major metropolitan areas that had persisted since 1966. It asserted the FCC’s authority to regulate cable development, laid down a number of firm requirements and restrictions, and at the same time permitted considerable latitude to communities in drawing up the terms of their franchises. It expressly encouraged communities to innovate, while reserving the authority to approve or disapprove many of their proposed actions.

The major decisions to be made next, and therefore the major focus of new cable research, will be on the local level. These decisions will be crucially important because cable television is no longer a modest technique for improving rural television reception. It is on the brink of turning into a genuine urban communication system, with profound implications for our entire society. Most important, cable systems in the major markets are yet to be built, and there is great pressure on the cities to start issuing franchises prematurely. The decisions shortly to be made will reverberate through the 1980’s.

Aware of the importance of these events, the National Science Foundation asked Rand in December 1971 to compile a cable handbook for local decisionmaking. This report presents basic information about cable television and outlines the issues
a community will face. It is addressed to citizen group members, local government officials, and other people concerned with the development of cable television in their communities.

Cable television embraces such a host of political, social, economic, legal, and technological issues that any single book on the subject is in danger of being shallow at best and pretentious at worst. Consequently, this Handbook is intended as an introduction and guide to these issues, which are explored separately in the series of companion reports listed inside the front cover.
SUMMARY

Cable television is a system for carrying television signals by wire rather than transmitting them over the air. Instead of the 7 or fewer television channels most Americans now receive, cable offers an immediate abundance of 20 channels, with more to come in the future. Cable television also holds out the promise of immediate viewer interaction with the program source. These technical prospects offer many undeniably dramatic possibilities, although some may prove to be more dramatic than feasible.

Cable television began as a service to communities where conventional television reception was inadequate. Even now, cable principally serves small towns and rural areas where it can provide better reception, more channels of broadcast television, and sometimes locally originated programs. These cable systems generally have been highly profitable businesses.

Today, however, cable television stands on the threshold of development in the major metropolitan areas of the United States. Cable systems in the cities and suburbs will differ greatly in technology, economics, and services from systems built outside the "major markets." And contrary to what many people suppose, cable systems are unlikely to be rich sources of profits and fees for cities—at least not in this decade.

In time, cable television may influence the way we live as radically as the automobile and the telephone have done. Most individuals and groups who have studied cable conclude that its growth will serve the public interest. Still, the long-range effects of cable communications are largely unknown. The necessary and unavoidable short-term decisions that must be made will have long-lasting, unforeseen, and possibly unintended consequences.

The development of cable television demands more decisionmaking by local
communities than most new technologies have required in the past. These decisions cannot and should not be left to federal and state regulators, or to large, nationwide corporations and interest groups. Local interests—business interests, local government officials, community group leaders, and individual citizens—should have a voice in shaping the terms of a community’s franchise, influencing its award, and determining the programming and services the system will deliver.

One can easily become fascinated with cable television as a new technology, but the programming it delivers is its real importance. Communities should focus on the services that cable can provide to people, not on the mechanics of the medium. Broadly speaking, cable offers five levels of improvements and new services:

- "More of the same"—the same sort of programming we presently receive, but with higher quality pictures and some programs for more specific audiences.
- Pay TV, offering sports events, first-run movies, Broadway shows, opera, and the like for payment of an extra fee.
- Public access channels available to individual citizens and community groups. Often using portable cameras, all sorts of groups—churches, Boy Scouts, minority groups, high school classes, crusaders for causes—can create and show their own programs. With public access, cable can become a medium for local action instead of a distributor of prepackaged mass-consumption programs to a passive audience.
- New services to individual subscribers, such as televised college courses and continuing education classes in the home. Cable’s capability for two-way communication between viewer and studio may in time permit doctors to participate in clinical seminars at distant hospitals, or enable viewers to register their opinions on local issues.
- New services to institutions, such as in-service training of nurses, teachers, and policemen. Public and private institutions might build their own two-way cable networks or lease channels to send x-rays among hospitals, exchange computer data, and hold televised conferences.

The technical design of cable systems must allow for future uses as well as for those feasible today. However, urban cable systems face a real chicken-and-egg problem in providing more than better reception and a few more television channels. Until new services are developed, cable in the larger cities may not attract enough subscribers to warrant large-scale commercial construction. But until systems are
built and large subscriber markets are assembled, new services will not be profitable. The result may be a slower pace of system construction in the major markets than some previous accounts have projected.

Because they use municipal rights-of-way, cable systems nearly always operate under a franchise from the local city, town, or county. At the federal level, cable television is regulated by the Federal Communications Commission (FCC). State regulation is also an increasing trend.

On March 31, 1972, a new set of FCC rules went into effect that changes the future course of cable development. The FCC rules permit all cable systems to bring in some television signals from other cities. At the same time, cable systems in the 100 largest television markets must provide at least 20 channels and must offer new nonbroadcast services, including:

- Local programming, usually known as "cablecasting," if the system has more than 3500 subscribers.
- Leased channels for pay TV and other services.
- Public access to a cable channel.
- A channel for educational programming.
- A channel for municipal services.
- A capacity for two-way services, such as public opinion polling, that require return signals from the subscriber.

The rules also require local franchise authorities to follow certain standards if their franchises are to obtain an FCC "certificate of compliance"—without which the cable system cannot carry any broadcast signals. Franchise fees to the city, for example, are limited to 3 percent of gross subscriber revenues. In granting a franchise, the local authority must consider the "legal, character, financial, technical, and other qualifications" of applicants by means of a "full public proceeding affording due process."

In effect, a local franchise authority cannot set more demanding requirements than those specified in the rules unless it can justify them to the FCC. This can be done by means of a "special showing" after a franchise has been awarded. However, the local franchisor has full authority to define the franchise areas, set rates for service, determine whether the system will be publicly or privately owned, and select the franchisee.

Local decisionmaking for cable television is a continuous process, moving from planning through drafting the franchise, selecting the franchisee, regulating the
system, and managing public services on cable. It is also part of the overall local political process. Many individuals and interest groups in the community will want to inform themselves on the issues and make their voices heard.

With growing public awareness of cable, ownership will perhaps be the most emotionally charged topic a community will confront. The basic ownership issue is whether the community should follow the standard pattern of franchising its cable system to a private operator. Other possibilities include municipal ownership, a public cable authority, noncommercial ownership, or a joint venture between a commercial and a noncommercial group. These alternatives offer prospects of greater community control and direct use of surpluses if the system is successful, but they also involve significant risk and demand a much greater community commitment. On a national scale, public or noncommercial cable systems would serve as useful yardsticks to measure the performance of private operators.

Two basic approaches, negotiation and competition, have been used in cable planning and franchising. Under the first, the city selects a prospective cable operator and negotiates the many terms and conditions that will go into the franchise. In contrast, "the competitive bid and award" approach involves a longer and more formal proceeding in which the franchise authority must detail the terms and conditions of the franchise in advance. The authority then invites bids from all interested parties and makes the award according to preestablished criteria.

Neither approach is clearly preferable to the other for all communities. Moreover, a combination of open competition and negotiation may be preferred. The Handbook describes the competitive bid approach more fully, so that communities can be familiar with the steps it may entail. In cases where franchising authorities prefer stronger elements of negotiation, some of the steps in the competitive process could be eliminated or compressed in time and scope. These steps include:

1. Adoption of procedures for planning and franchising.
2. Assessment of community needs, objectives, and alternatives.
3. Public hearings and tentative decisions on major issues such as ownership, franchise district boundaries, and interconnection.
4. Hearings on and adoption of a draft franchise document describing the general terms and conditions of the final franchise.
5. Preparations and dissemination of a Request for Proposals from franchise applicants, based on the draft franchise document.
6. Hearings on proposals received from applicants for the franchise.
7. Decision on award of franchise.

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10. Continuing administration of the franchise.

Citizen participation should be encouraged throughout the process. The franchising authority will want to consider forming citizen groups to advise it on issues such as ownership, public access, and use of the education and local government channels. The authority also will want to consider its need for community surveys, consultant assistance, and independent studies.

The FCC has mandated one cable channel for education, one for local government, and one for public access in the major markets. The cable operator is to furnish these channels free of charge on an experimental basis for at least five years. Communities outside the major markets also may require these access channels in their franchises.

Simply making channels available, however, by no means guarantees that they will be used well or even used at all. A community therefore should start drawing its plans to use the access channels early in the decisionmaking process. Public services on cable can include:

- In-school instruction
- Instruction for homebound and institutionalized persons
- Preschool education
- High school and post-secondary degree courses in the home
- Career education and in-service training
- Community information programming
- Community information centers
- Municipal closed-circuit applications

The most important reason to experiment now is to assure that public uses of cable are not foreclosed by a rapid development of entertainment and other commercial services. Consequently, civic leaders, educators, and local officials should take seriously their mandate to develop applications for the access channels in the next five years.
ACKNOWLEDGMENTS

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Finally, special thanks go to Marilyn Fisher for her able research assistance and to Will Harriss for untangling some of the complex ideas and syntax that surround cable television.

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Chapter 1
GETTING THE PICTURE

Cable television is preparing the way for a revolution in communications that may or may not happen. Instead of the 7 or fewer television channels most Americans now receive, cable offers an immediate abundance of 20 channels, with more to come in the future. Cable television also holds out the promise of immediate viewer interaction with the program source. These technical prospects offer many undeniably dramatic possibilities, although some may prove to be more dramatic than feasible.

If all goes well, some experts believe that cable television will influence the way we live as radically as the automobile and the telephone have done. Others, less sanguine, remind us that the mere existence of a glittering new technology is by no means a guarantee that it will live up to its promise—and they point to conventional broadcast television as an example of what they mean. The future reality of cable is likely to fall somewhere between the still-vaster Wasteland that pessimists foresee and the Garden of Earthly Delights envisioned by cable enthusiasts.

Broadly speaking, cable offers five levels of improvements and new services:

- "More of the same"—the same sort of programming we presently receive, but with higher quality pictures and some programs for more specific audiences.
- Pay TV, offering sports events, first-run movies, Broadway shows, opera, and the like for payment of an extra fee.
- Public access channels mandated by the Federal Communications Commission to be available on a first-come, first-served basis to individual
citizens and community groups at little or no charge. Citizens may speak on any subject they choose. Often using portable cameras, all sorts of groups—churches, Boy Scouts, minority groups, high school classes, crusaders for causes—can create and show their own programs. With public access, cable can become a medium for local action instead of a distributor of prepackaged mass-consumption programs to a passive audience.

- New services to individual subscribers, such as televised college courses and continuing education classes in the home. Cable's capability for two-way communication between viewer and studio may in time permit doctors to participate in clinical seminars at distant hospitals, or enable viewers to register their opinions on local issues.

- New services to institutions, such as in-service training of nurses, teachers, and policemen. Public and private institutions might build their own two-way cable networks or lease channels to send x-rays among hospitals, exchange computer data, and hold televised conferences.

Decisions made in the next few months and years will determine what mixture of these opportunities will prevail.

A great deal is at stake. Municipal officials and local citizens are immediately concerned about cable television for three principal reasons. First, cable comes inside the home and directly affects the way people think, learn, and live. Second, cable may change the political and social patterns of community life. Third and most important, cable television development, more than did the appearance of such other new technologies as the computer and the jet plane, demands decisionmaking by local communities. These decisions cannot and should not be left to federal and state regulators, or to large, nationwide corporations and interest groups.

This Handbook is an introduction to cable and a guide to the issues involved in cable television decisionmaking at the local level. It does not pretend to resolve these issues or lay down a set of cookbook instructions for any community to follow exactly. No one knows all the answers—or even all the right questions—for each local situation. In the end, there is no substitute for the community's own intensive study of the issues; if this Handbook is useful in that study, it will have served its purpose.

Three themes pervade the Handbook:

- Cable television stands on the threshold of development in the major metropolitan areas of the United States. Cable systems in the cities and su-
burbs will differ greatly in technology, economics, and services from systems built in the past to serve small towns and rural areas. And contrary to what many people suppose, cable systems are unlikely to be rich sources of profits and fees for cities—at least not in this decade.

- One can easily become fascinated with cable television as a new technology, but the programming it delivers is its real importance. Communities should focus on the services that cable can provide to people, not on the mechanics of the medium.

- Local decisionmaking for cable television is part of the overall political process. Important as study and analysis may be, they do not substitute for the hard work of building a political consensus on cable issues. Many individuals and interest groups in the community will want to play a role in that process.

Some say that the issues of cable television development are too important to leave to the private marketplace. Others—equally adamant—think them too important to leave to government regulators. This Handbook urges that all local interests—business interests, local government officials, community group leaders, and individual citizens—have a voice in drafting a community's franchise, influencing its award, and determining the programming and services the system will deliver.

WHAT CABLE TELEVISION IS

Cable television is a system for carrying television signals by wire rather than transmitting them over the air. The wire used is a coaxial cable, illustrated in Fig. 1, that can carry many different television channels simultaneously without interference. In contrast, an ordinary telephone wire cannot carry even a single television channel over appreciable distances.

A typical cable system is shown in Fig. 2. Signals from local television stations are picked up by special antennas placed on a hilltop or some other favorable location. A cable brings the signals to a "headend," where they are amplified and fed onto the cable distribution system. The distribution system consists of trunk cables extending from the headend, "feeder" cables branching out along streets and alleyways, and "drop" cables running from a feeder line into subscribers' homes. Thus, each subscriber is connected by cable to the headend. The cables are strung
Fig. 1—A typical coaxial cable

on overhead utility poles along with electric and telephone wires or buried in underground ducts.

Cable television began as a service to communities where conventional television reception was inadequate. The cable operator erected a powerful community antenna that picked signals off-the-air, and his cable system then piped them into subscribers' homes. This was the origin of "community antenna television," or CATV, an acronym gradually being supplanted by the term "cable television," or simply "cable." Early cable subscribers paid high installation charges and several dollars a month to receive the same programs people in most other places could pick up with simple rooftop antennas. Subscribers could also receive UHF television stations—those above Channel 13—with the same picture quality as that on the lower-frequency VHF channels. Early cable system entrepreneurs also found they could attract subscribers by bringing in television signals unavailable in the local community. For instance, residents of Bakersfield, California, pay to see the popular Los Angeles stations more than 100 miles away. Microwave relay brings these stations to the Bakersfield headend, which then distributes them to subscribers on the cable. Consequently, "importation" of distant signals became an important way to sell new cable subscriptions.

Because they use municipal rights-of-way, cable systems nearly always operate under a franchise from the local city, town, or county. Up to the mid-1960s, the federal government and the states showed little concern with cable regulation. In
Fig. 2—Conventional one-way cable system serving residential subscribers
1966, however, the Federal Communications Commission (FCC) exerted its regulatory authority over cable and prohibited further importation of distant signals into the 100 largest U.S. television markets. This stopped most new cable construction in the cities. The "freeze"—instituted largely because of television broadcasters' fears about competition from cable—lasted for almost 6 years. Cable systems continued to grow where they could offer better reception service and, outside the major markets, where they could offer more television channels than were available locally. Many also began to display so-called "automated" services—time, weather, news, and stock market information—on unused channels. And a few systems began to originate their own programming, especially to carry local news, sports events, and other features not available on broadcast television. In New York City, for example, the chance to watch professional basketball and hockey games on cable has been a major inducement in signing up subscribers. Carrying FM radio stations on the cable has also been a popular service in many communities.

Up to 1972, then, cable television grew by providing (1) better reception, (2) more channels of broadcast television, and (3) some local origination. On March 31, 1972, a new set of FCC rules went into effect that will change the future course of cable development. As described in Chap. 5, the FCC rules permit all cable systems to bring in some distant signals. At the same time, cable systems in the major markets must provide at least 20 channels and must offer new nonbroadcast services, including:

- Local programming, usually known as "cablecasting," if the system has more than 3500 subscribers.
- Leased channels for pay TV and other services.
- Public access to a cable channel.
- A channel for educational programming.
- A channel for municipal services.
- A capacity for two-way services, such as public opinion polling, that require return signals from the subscriber.

This list of new services is primitive compared with those projected for the 1980's and beyond. Sometime after 1980, cable television may be used for interactive education in the home, electronic mail delivery, dial-up video libraries, computer

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1 New York City is the largest television market. Columbia, South Carolina, a market of about 250,000 people, is the 100th largest. A full list of the "top 100" or "major" markets is given in Appendix A.
networks linked by satellite, and a host of other commercial and public services. The full array of possibilities is only hinted at in Fig. 3.

But today, these are only possibilities. Whether cable television of the future will provide a pipeline for new services or simply more channels of entertainment depends on decisions that will be made in this decade. And despite the increased involvement of federal and state regulatory authorities, these decisions will, for the most part, be local ones.

BASIC FACTS ABOUT CABLE 2

Cable Systems and Subscribers

As of September 1, 1972, an estimated 6.5 million U.S. households subscribed to cable television—10 percent of all television households in the country. Nearly all U.S. households (96 percent) have at least one television set.

A total of 2,862 operating cable systems serve 5,377 U.S. communities. Another 1,689 franchises have been awarded to systems not yet operating. Most systems are located in small towns and rural areas. The majority of large U.S. cities do not have cable systems in operation today.

Most U.S. cable systems are small. Two-thirds have fewer than 2,000 subscribers; only 105 systems have more than 10,000 subscribers. The largest U.S. cable system, with about 65,000 subscribers, is in San Diego, California. Some Canadian cable systems are larger; the one serving Vancouver, British Columbia, has almost 140,000 subscribers.

Projected Growth of Cable Television

Although still small by U.S. industry standards, cable television has expanded rapidly. The growth in cable subscriptions is illustrated in Fig. 4.

Projecting the percentage growth of cable subscribers over the past decade to 1980 gives an estimate of 30 million cable subscribers, or 42 percent of U.S. television

2 These data are compiled from the Television Factbook, 1972-73 edition, and recent issues of Television Digest.
Fig. 3—Potential growth of cable television services
Fig. 4—Growth of cable television subscribers in the United States
households for that year. This would be at the bottom of the range estimated by the recent Sloan Commission on Cable Communications; they forecast that 40 to 60 percent of households will be on the cable by 1980. The National Cable Television Association, an industry group, predicts a lower range of 35 to 40 percent. Cable growth over the past 2 years has been somewhat slower than before, perhaps because of the FCC freeze. Projecting 1971-72 percentage growth to 1980 gives only 15 million cable subscribers, or 21 percent of households.

Estimates of cable subscribers in 1980 thus range from 15 million to perhaps 44 million, as shown in the dashed portion of Fig. 4. No matter which projection is used, cable is expected to grow considerably throughout this decade.

HOW TO USE THE HANDBOOK

This Handbook is organized for easy scanning and selectivity. Chapters 2, 3, and 4 contain basic information on cable technology, economics, and ownership alternatives. They provide a background for the other chapters.

Chapters 5, 6, and 7 describe the process of local planning, franchising, and regulating cable television. They outline the important issues that must be decided when cable comes to a community.

Chapters 8, 9, and 10 concern uses of the cable system. They emphasize public access, education, municipal services, and other public applications. Many examples are presented, but the discussion is issue-oriented rather than being a menu of programs and services.

Chapters 2 through 9 each end with a Summary Checklist of questions and issues a community should consider. A Checklist also can serve as a quick guide to readers who want to know what topics the chapter discusses.

Obviously, a single Handbook can treat some issues only superficially, and others not at all. For more information on specific subjects, readers are urged to turn to the companion reference reports listed inside the front cover. Other references and sources of information are listed at the end of the Handbook, along with additional statistical data, detailed financial projections for three simulated cable systems, and a glossary.
Chapter 2

CABLE TECHNOLOGY

Probably you have heard of the little girl who returned a book to the library with the remark, “This book told me more about penguins than I really wanted to know.” This chapter threatens to do the same for cable technology; but do not despair. Reading only the first and last sentences under the major headings may satisfy your purpose, and you can resume at Chap. 3. The rest of the Handbook is much less technical.

Cable television technology is in transition. Most of today’s cable systems carry only broadcast signals. As indicated in Table 1, few have the channel capacity or the nonbroadcast communications capability to provide the new services of the future.

As a result, the community and the cable operator face the same problem: how to specify system design today that will provide capacity for an unknown mixture of services in the future. The economic feasibility of services other than television distribution (and perhaps pay TV) has yet to be demonstrated. Still, designing a cable system only for the more profitable services may foreclose other options. For example, remote medical diagnosis might require several two-way video channels between outpatient clinics and a central hospital. A system designed primarily for television distribution, with only the capacity to return “yes or no” data responses, could not accommodate this service. But building in a multichannel, two-way video capability at the outset might make the system too costly to survive. Moreover, cable

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1 Much of the material in this chapter is discussed more fully in two companion reports: Carl Pilnick, *Cable Television: Technical Considerations in Franchising Major Market Systems*, R-1137-NSF; and Carl Pilnick and Walter S. Buer, *Cable Television: A Guide to the Technology*, R-1141-NSF.
<table>
<thead>
<tr>
<th>Service Category</th>
<th>Type of Communication</th>
<th>Present Availability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distribution of broadcast television programs</td>
<td>One-way, headend to all subscribers</td>
<td>Operational on all cable television systems</td>
</tr>
<tr>
<td>Local cablecasting</td>
<td>One-way, headend to all subscribers</td>
<td>Operational on about 20% of U.S. systems; required of all systems with more than 3500 subscribers</td>
</tr>
<tr>
<td>Public access, educational, and government channels</td>
<td>One-way, headend to all subscribers</td>
<td>Operational on a few systems; required of all new major market systems</td>
</tr>
<tr>
<td>Pay TV or private channel programming</td>
<td>One-way, headend to certain subscribers (two-way useful, but not required)</td>
<td>In prototype form on a few systems</td>
</tr>
<tr>
<td>Subscriber response services</td>
<td>Two-way, data response from subscribers to headend</td>
<td>Under field test on a few systems but not yet operational; &quot;technical capacity for nonvoice return communications&quot; required of all new major market systems</td>
</tr>
<tr>
<td>Information retrieval, document delivery, and other &quot;new services&quot;</td>
<td>Two-way data, voice, and video between subscribers and headend, and possibly among subscribers</td>
<td>Under development</td>
</tr>
</tbody>
</table>
technology is developing so rapidly that many components installed today will be obsolete before the operator's franchise expires.

Faced with an uncertain demand for future services, cable system operators naturally lean toward a system design that minimizes initial cost and defers additional investment until such time as revenues from new services can be better forecast. This is sometimes achieved at the expense of system flexibility for expansion. The issue, then, is how to strike a balance between initial system capacity, ease of expansion, and cost.

The focus of this chapter is on technology for new systems planned for the major markets, recognizing, however, that upgrading existing systems will be a major task. Although technical considerations are intimately linked with costs, the discussion of system costs is deferred to the next chapter.

CABLE SYSTEM DESIGN

A conventional cable system, such as the one illustrated in Fig. 2, distributes signals from a headend to many subscribers. This is known as a party-line or "tree" network. In contrast, each telephone subscriber has his own link with a local switching center. These two types of networks are shown schematically in Fig. 5; each has its special advantages that make some services easier to provide on a cable system, and others more feasible over the switched telephone network.

The major components of a conventional cable system are the antennas and headend facilities, the cable distribution system, and the subscriber equipment.

Antennas and Headend Facilities

A cable system locates its receiving antennas where they can pick up the strongest television signals, usually on hilltop towers or the roofs of tall buildings. A separate antenna generally is used for each broadcast station, so it can be tuned to the station's frequency and mechanically aligned to receive the strongest and clearest signal. Coaxial cable brings these signals to the headend, usually located in a small building near the tower site. In cities the headend might be in the basement of the building on which the receiving tower stands.

The headend processes the television signals for distribution on the cable network. Signal processing includes several functions:
(a) Cable Television: primarily a one-way, party-line or "tree" network

(b) Telephone: a two-way, private-line network

Fig. 5—Schematic comparison of cable television and telephone networks
- Amplifying each signal to sufficient strength for distribution.
- Filtering out unwanted signals.
- "Translating" or changing the frequency of some channels so they can be sent over the cable. UHF stations are translated to an otherwise unused VHF channel so that the subscriber can select them on the VHF tuner of his television receiver. Some VHF stations also may have to be translated to a different channel because of local interference problems.
- "Demodulating," or extracting the TV information from signals imported by microwave to the community.
- "Modulating" these imported signals and any video signals that originate within the cable system; that is, providing them with a carrier frequency to match a standard VHF channel. This must be done for all local cablecasting, access programming, automated services, and any other locally generated signals.
- "Mixing" all the signals into one composite signal for distribution on the cable.

Equipment for these functions has long been available. New systems, however, will require other headend equipment that is now just emerging from laboratory development—such as picture scramblers for pay TV or private channel viewing, microwave transmitters for interconnecting cable headends, and computers for two-way services. Consequently, the complexity and cost of headend facilities will increase substantially in the future.

The cable system's studio facilities will also be connected to the headend. A studio may be located in the same building as the headend to minimize the connections required; if located at a distance, it would have its own cable link to the headend.

**Cable Distribution Plant**

Television signals lose strength as they travel through the cable, an effect known as "attenuation." The larger the cable diameter, the less the attenuation. Consequently, 1/2-inch or 3/4-inch cables are used for trunk lines, the main branches of the distribution network. They are both more expensive and more difficult to install than the smaller cables used for feeder lines.

The network must use many amplifiers to compensate for attenuation. Particular care goes into designing trunk amplifiers, since in large part they determine the
system's signal quality. Three to four amplifiers are required for each mile of cable trunk. A "bridger" amplifier transmits signals from the trunk into each feeder cable. "Line extender" amplifiers may be used in the feeder line as well.

Each amplifier introduces some slight picture distortion, which increases as each amplifier is "cascaded" in series. As a result, there is a practical limit to the number of amplifiers that can be cascaded before the signal quality becomes unacceptable. Where cable competes with good off-the-air reception, the limit may be about 20 to 30 amplifiers in cascade, corresponding to a cable run of between 5 and 10 miles from the headend. Since the cable route generally twists along city streets, however, the effective radius that can be served from a single headend is limited to about 4 to 7 miles. Larger areas can be served by interconnecting headends, as discussed later in the chapter.

Figure 6 illustrates an aerial cable installation. The coaxial communications cable is lashed to a smaller steel "strand" or "messenger" cable for mechanical support. A line extender amplifier appears above the lineman's head. Next to it is a "tap" that connects subscriber "drop" lines to the feeder cable.

**Drops and Subscriber Equipment**

A 1/4-inch drop cable brings signals to the subscriber's house from the closest point on the feeder line. The drop cable usually connects to a small transformer that matches the characteristics of the cable to the input of the TV set. In systems carrying more than 12 channels, the drop will connect to a "converter" or a cable switch, described in the next section. The subscriber also may want a switch to connect his set back to a rooftop antenna should the cable system fail (or to watch over-the-air pay TV).

The home television receiver is the weakest link in the cable system. Today, TV sets are designed to use signals received off the air, not from cable. As a result, the TV set contains amplifier and tuning circuits that are not needed for cable reception, but lacks some desirable features. A special input circuit in the set, matched to the cable and shielded from off-the-air signals, could greatly improve reception for many cable subscribers. Connecting the cable directly to the tuner inside present sets would also help.

Although TV set manufacturers are developing cable-compatible models, mass production must await agreement on standards and the emergence of a larger market of cable subscribers—perhaps 15 to 20 percent of television households.
Fig. 6—Typical aerial, single cable installation
These preconditions should occur before 1980. When special receivers are available, cable operators may want to lease them to subscribers as part of their regular cable service. Many existing cable franchises prohibit the operator from leasing or servicing TV sets, usually as a result of pressure from local TV retailers and repairmen. They argue that such leasing would give the cable operator an unfair competitive advantage. The operators contend that TV set leasing not only is fair, but also allows them to guarantee better quality reception and expedites the development of new services. Communities might well strike a middle course by neither forbidding TV set leasing in the cable franchise, nor permitting the operator to require receiver leasing as part of his overall service. The franchise also might permit the operator to make TV set modifications (as, for example, by connecting the cable directly to the tuner inside the set) where necessary to improve reception.

**EXPANDING SYSTEM CAPACITY**

The communications capacity of a cable system has been measured by the number of television channels it could deliver simultaneously to subscribers. The earliest cable systems carried three or five television channels. Most systems built in the last decade have had a 12-channel capacity. Since March 31, 1972, FCC regulations require at least 20 channels for new construction in the major markets.

Channel capacity can be somewhat misleading as a measure of the non-broadcast services that a cable system can deliver. More generally, communications capacity is measured by the amount of information a system can transmit. This in turn usually depends on the range of electrical signal frequencies it can carry, known as its "bandwidth." Signal frequencies are denoted by cycles per second, or by the more modern term "hertz," abbreviated Hz. Each U.S. standard television channel requires a large frequency bandwidth of 6,000,000 hertz, usually stated as 6 Megahertz, abbreviated 6 MHz. In contrast, telephone channels need only 3000 to 4000 hertz, or 3-4 Kilohertz (3-4 KHz). Data channels for sending short messages or alarm signals may require only about 100 Hz. A 20-channel cable system thus in principle could carry 30,000 to 40,000 telephone messages instead, or more than one million fire and burglar alarm channels. In this sense, comparing a coaxial cable with a telephone wire is, as FCC Commissioner Nicholas Johnson says, like "comparing Niagara Falls to a garden hose." Certain practical inefficiencies would reduce these numbers, but data messages in 10,000 or more homes could be sent and received in a portion of a single 6MHz channel.
Technical limitations on channel capacity are set principally by cable amplifiers. Current amplifiers are limited to a usable bandwidth of about 300 MHz. While this theoretically is equivalent to 50 television channels, interferences among channels give a practical limit of about 25 to 35 channels for each cable.

Most cable systems previously were designed for 12 channels, however, in order to match the 12 channels of the standard VHF tuner on television receivers (channels 2-13). If a cable carried more than 12 channels, a subscriber could view them only with a special converter attached to the TV set. Using the UHF tuning capacity of the receiver would not work, because UHF frequencies are too high for the cable system to carry directly.

Expanding channel capacity to or beyond the FCC's 20 channel minimum for the major markets thus requires a new cable system design. The three principal choices are multiple cables, converters, or a switched system. (See Fig. 7.)

Another problem is "on-channel" or direct interference between VHF broadcast and cable signals. Broadcast stations transmit a strong signal to most TV receivers within 5 or 10 miles, which pick them up even without an external antenna. Because television signals travel slightly slower through cable than they do through the air, the cable signal arrives a small fraction of a second later than the off-the-air signal. The tiny difference is enough to cause a "ghost" image on the TV receiver which can make the picture unacceptable (Fig. 8).

Consequently, if a community has three strong VHF broadcast stations, those three channels probably cannot be used for cable transmission. (They may be usable for automated services and other nonbroadcast applications, however.) Large cities such as New York and Los Angeles may have as many as seven local VHF stations. As a result, seven cable channels may be unusable, and a 12-channel system, without converters, could not even deliver all the stations the subscriber could receive directly off the air.

Multiple Cable Systems

The most straightforward solution to the capacity problem is to install more than one cable. If two cables with 12 channels apiece are provided, subscribers can

---

2 Engineers find it hard to agree on a precise channel limit, since it depends on the signal quality one is willing to accept, the particular amplifier and cable system design, and environmental factors such as the temperature changes the amplifier is subject to. The 25 to 35 channel range represents some upper limit to today's state of the art.
(a) Dual cable system

(b) Single cable system with converters

(c) Switched system

Fig. 7—Three methods of expanding channel capacity
receive 24 channels by using a simple switch to select between the two cables (Fig. 7(a)).

Simplicity is the principal advantage of this approach. It eliminates converters, which are problem components, and thus makes the system more reliable. The cable can carry signals at standard VHF frequencies selected to minimize interference among channels. Finally, if each cable is designed initially to carry more than 12 channels, a dual cable system doubles the overall communication capability for two-way or other new services.

Dual (or multiple) cable systems are obviously more expensive than single cable systems—not twice as much, since the added installation costs are small, but about 50 percent more. This may or may not be competitive with other ways to expand
channel capacity and must be examined on a case-by-case basis. Another serious disadvantage is that a dual system does not address the problem of on-channel interference. If channel 3 is subject to direct interference, it cannot be used for either cable. Consequently, instead of the nominal 24-channel capacity, a community with four strong over-the-air broadcast stations will have only 16 usable channels on a dual cable system. This could still satisfy the FCC’s 20-channel requirement, since all 20 channels need not be used for broadcast television, but it may not be what the community wants. A solution is to connect the subscriber’s switch directly to the tuner inside his set with shielded cable, but this requires modification of each TV set subject to on-channel interference.

Converters

A converter changes a nonstandard frequency channel to a VHF channel that can be tuned directly on the subscriber’s TV set. Some older style converters, called block converters, translated an entire block of 12 channels from a higher frequency range to the standard VHF band. Most present converter systems use tunable converters (Fig. 7(b)). In effect, the converter replaces the standard TV set tuner and provides more channel positions. Channels may be selected with a dial like that of standard tuners, a slide lever, or push buttons. (Fig. 9).

The extra channels in a converter system are carried on the cable at frequencies between channel 6 and 7 (known as the mid-band) and above channel 13 (known as the super-band). The industry today designates nine mid-band channels and thirteen super-band channels below 300 MHz. The converter changes the frequency of a selected channel to a standard VHF channel frequency that is unused for broadcasting in the community. The TV set tuner is set permanently to that channel, and all selection is performed at the converter. The converter thus completely eliminates on-channel interference, since its output will never be at the same frequency as a strong local station.

However, converters introduce other interference and picture degradation difficulties. Many converters respond inadequately to variations in signal strength and are overloaded by strong input signals. This causes picture distortion. The converter oscillator, a component necessary for frequency conversion, can drift with temperature and time. Channel selectivity—the ability to distinguish sharply between adjacent channels—is sometimes poor. And because more frequencies are carried on the cable, more interference problems among channels arise.
Fig. 9—Three types of cable television converters
These problems are due more to an emphasis on low cost in converter design than to intrinsic technical limitations. Converters range in price from $35 to $40 in small quantities to $25 to $30 in lots of 1000 or more. Since a converter is needed for each TV set, a $25 unit cost may represent 15 to 20 percent of total system capital investment. Consequently, the pressures for low-cost converter design are great. Initial cost savings, however, may be outweighed over a few years by added service calls and subscriber complaints. Still, the set-top converter is today the most popular approach to providing a minimum 20 channel capacity. Even dual cable systems may need a converter to utilize channels subject to direct interference.

Switched Systems

Switched systems are a completely different approach to expanded channel capacity and place channel selection outside the subscriber’s home (Fig. 7(c)). All of the several varieties of switched systems bring signals from the headend to a switching center that serves from twenty to several hundred subscribers. Two separate wires or cables run from the switching center to each subscriber receiver. One wire carries subscriber requests to the switching center, and the other returns the selected television signal. Since the subscriber receives only one channel at a time, his link to the switching center can be a less expensive cable or even special pairs of wires.

Switched systems are simple in concept and may have advantages for certain applications, but they demand complex wiring and numerous switching centers. Moreover, each TV set requires a separate set of cables or wires to the switching center. In crowded urban areas, the cost of switching centers may be high and the cost of laying the necessary wiring underground may be prohibitive. Switched systems of the kind now available are not likely to be a significant factor in major-market cable television operations in the United States.

Comparing Alternatives

None of the above techniques is an obvious "best solution" to the expanded channel problem. Systems with multiple cables eliminate converters, but do not prevent direct interference. Converters solve the direct interference problem completely, but introduce new possibilities for interference and picture degradation. Switched systems obviate both the direct interference and the converter problems, but seem too cumbersome and expensive for major market operations.
A principal design problem is that all cable systems must be compatible with conventional TV receivers. Logically, a cable-compatible receiver could be designed that would ease the above problems and lower receiver costs as well. It would have a multichannel tuner built in (eliminating the need for a separate converter) and better input shielding (eliminating on-channel interference).

Until cable-compatible receivers are available, a community's choice generally will be between a dual cable system, a converter system, or a hybrid of both. A current hybrid approach is to install a single cable with converters, plus a second, "shadow" trunk—that is, an extra trunk without amplifiers or other electronic components. The shadow trunk is available when the demand for more channels or new services requires it. TelePrompTer, the largest company in the industry, goes further and installs both shadow trunk and feeder lines in its new major market systems.

The other general approach is to build a full dual cable system—dual trunk, feeder, and drop lines—with converters where necessary. Such a system with converters may cost 30 to 40 percent more than a single-cable, shadow-trunk system, but it provides more inherent capacity for future expansion. Whether this added flexibility is worth the extra cost is a question for each community to decide.

**TWO-WAY COMMUNICATIONS**

Besides transmitting "downstream" to the home, a coaxial cable can carry information back "upstream" from subscribers. This ability suggests a great variety of new services and gives cable television much of its "blue-sky" allure. (See Fig. 3.)

The FCC now requires each new major-market cable system to "maintain a plant having technical capacity for nonvoice return communications." This is interpreted to mean that the system meets the FCC's intent if it eventually can provide return communication (from subscribers to the headend) without "time-consuming and costly system rebuilding."

**Subscriber Response Services**

Television pictures, voice conversations, and data messages are all carried on the cable as electrical signals; they differ primarily in the frequency bandwidth and the subscriber equipment each requires. In principle, a subscriber could send data,
voice, or video signals upstream to the headend or to other subscribers on a two-way cable system. In practice, upstream video transmission will be limited to programs from local cablecasting studios and schools, hospitals, or similar institutions. Originating television programming from the home will be too expensive. Moreover, because of cable's party-line configuration, the telephone network will remain a better choice for private, two-way voice conversations.  

Consequently, an upstream return path from the home will be used principally to carry data messages from subscribers. These messages could include responses to questions asked on an educational program, opinions on a proposed city ordinance, or orders to buy the sewing machine just advertised on the screen. Alarm messages also could be sent automatically to a central station if a fire or intrusion occurred in the home.  

These messages all have common characteristics. They require much less bandwidth than voice conversations, and they can be encoded in digital form for rapid computer processing. Moreover, digital messages from thousands of subscribers can be packed together into a single data stream that uses the upstream cable capacity very efficiently.  

Each subscriber would have his own digital code or "address" for two-way response services. A computer at the headend (or some other suitable location) would query each subscriber in turn, using a special downstream channel. This technique is known as "polling." A two-way terminal attached to the cable and TV set would record the subscriber's messages, store them, and send them upstream when the terminal was polled. The messages would then be recorded at the headend computer or sent on to the city council chambers, the police station, or the department store.  

The basic subscriber response terminal looks like a small box with a telephone-like keyboard and a lock to prevent unauthorized use (Fig. 10). A tunable converter might be built in, and smoke sensors, burglar alarms, and utility meters could be connected to it. Several companies are now experimenting with prototype subscriber terminals. They cost close to $1000 today, but further development and mass production may reduce the price to $100 or so by 1980.

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4 Cable systems might install a shared voice channel, although its advantage over the telephone scene questionable. For example, a city council meeting televised on a two-way cable system might allot time for audience questions and comments. With the proper equipment at home and in the city council chambers, a subscriber could signal to be heard and then wait his turn until an upstream voice channel were available. While his question was being transmitted upstream, that voice channel would be denied to other users.  

* Digitally encoded messages are transmitted in the form of electrical signals of two discrete values, like the dots and dashes of the Morse telegraph code. The amount of information transmitted is expressed in terms of "binary digits" or "bits."
(a) Theta-Com "SRS" Terminal

(b) EIE "Data Entry" Terminal

Fig. 10—Typical terminals for two-way subscriber response services
Some specific two-way services such a terminal can handle include:

- Counting the number of subscribers tuned to a given channel
- Ordering an air conditioner advertised on "special sale"
- Requesting a pay-TV movie
- Answering a multiple choice quiz presented as part of a televised college class
- Responding to a political opinion poll
- Reading utility meters automatically
- Monitoring fire and burglar alarms

Other services, such as browsing through a catalog displayed on the TV screen, making theater reservations, or requesting a paragraph from the *Encyclopaedia Britannica* will require more complex subscriber terminal equipment.

**Two-Way Transmission Techniques**

Two-way services obviously require a cable system that can transmit messages in both directions. There are two basic technical approaches today:

1. **Use separate cables for upstream and downstream transmission;**
2. **Send signals in both directions simultaneously on the same cable, using different frequency bands to separate the upstream and downstream signals.**

Having a separate cable for upstream transmission presents fewer technical problems and offers more upstream capacity.

Carrying signals in both directions simultaneously on a single cable costs less but is more complex. The cable itself poses little difficulty, but amplifiers are essentially one-way devices. Consequently, the upstream and downstream signals must be routed to different amplifiers and must be separated by electronic filters. (See Fig. 11.)

The single-cable approach is popular with cable operators because its installation cost is lower. However, the technical problems have not been fully resolved. Designing filters for two-way operations is difficult; each filter will add some distortion to the downstream video signal, and the cumulative effect of many amplifiers in cascade may be an unacceptable picture. Although the problem should be worked out in time through experience and better filter design, it has been a barrier to early
Fig. 11—Simultaneous two-way communication on a single cable
two-way development. At the very least, the need for two-way filters will restrict the number of amplifiers that can be cascaded, and thus further limit the area that can be served from a given headend.

In summary, the separate cable approach to two-way cable communications is presently more reliable, but more costly. The single-cable approach minimizes initial cost, but still leaves technical problems. Again, there is no “best answer” for every community. Some cities may want to require dual trunk and feeder cables—at least in shadow form—that can be used to expand either upstream or downstream capacity, or some combination of both. A city that foresees a need for extensive two-way capacity, perhaps to furnish two-way video links among schools, hospitals, or police stations, may prefer to install entirely separate cables for these applications.

Two-Way Demonstration Projects

The first field tests of two-way cable communications began in 1971. (Table 2 lists the major ones.) They are being conducted only as tests, not as attempts to

<table>
<thead>
<tr>
<th>Equipment Manufacturer</th>
<th>Test Location</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theta-Com</td>
<td>El Segundo, Calif.</td>
<td>System under construction, 30 terminals to be installed in first phase</td>
</tr>
<tr>
<td>Electronic Industrial Engineering</td>
<td>Orlando, Fla.</td>
<td>24 terminals installed in first phase</td>
</tr>
<tr>
<td>Vicom</td>
<td>Overland Park, Kans.</td>
<td>6 terminals installed</td>
</tr>
<tr>
<td>Scientific-Atlanta</td>
<td>Carpentersville, Ill.</td>
<td>System for fire and burglar alarms under construction</td>
</tr>
<tr>
<td>TOCOM</td>
<td>Irving, Texas</td>
<td>Planned for installation in 1973</td>
</tr>
</tbody>
</table>

Table 2
CURRENT FIELD TESTS OF TWO-WAY CABLE SYSTEMS
deliver two-way services to paying subscribers. As of January 1, 1973, fewer than 100 two-way subscriber terminals were in active operation in the United States.

To no one’s surprise, a number of technical “bugs” have shown up in these tests. Still, the technology for two-way subscriber response services is known, and the engineering problems will be resolved in time. By 1980, most large U.S. cable systems should have operating, two-way transmission facilities. The prospects for using these facilities for two-way services are less clear, however, and await the first full-scale market tests sometime later in this decade.

INTERCONNECTING CABLE SYSTEMS

The Need for System Interconnection

Interconnection of cable systems was not required in the past, but it may become desirable or necessary in the major markets today for several reasons:

- Neighborhoods or communities within the franchise area may want different programming, because of ethnic, cultural, or economic differences. Providing certain channels to some areas and not others is called internal interconnection or “subdistricting.” For example, the New York City franchises require TelePrompTer and Sterling Communications to divide their Manhattan cable systems into at least 10 subdistricts.
- Most large cities will need more than one headend, since present amplifier technology limits the area that can be served from a single point. Consequently, distributing programming simultaneously throughout the city will require interconnection of the multiple headends or “hubs” (Fig. 12).
- Suburban cable systems in the major markets may not be economically viable unless they are interconnected with other suburbs or the central city.
- Televised university extension classes, sports events on pay TV, and other new services may not be feasible unless distributed simultaneously to a large base of subscribers in a number of cable systems.
- Citizens may want interconnection in order to distribute public access and other community programming to geographically separated neighborhoods that share similar interests. For example, access programming pro-
Fig. 12—Area interconnection of multiple hubs
duced in Harlem may be of far more interest to some citizens in Newark—across the Hudson River and in a different state—than to adjacent neighborhoods on Manhattan's upper east side.

- Communication satellites and microwave relay networks may make regional or national networking of cable systems feasible.

Interconnection is therefore an important topic for communities to consider. However, a franchise requirement of multichannel, wide-area interconnection can raise system costs substantially. The FCC does not presently have any rules or requirements for interconnection, except where over-the-air frequency assignments are involved.

**Interconnection Techniques**

Internal interconnection requires a separate trunk line for each subdistrict and switching equipment at the headend. Switching costs are minor if only one or two channels are involved—for example, switching a single public access channel at the headend to carry programs originated in one of the subdistricts. It will cost much more to enable each subdistrict to receive access programs simultaneously from all the other subdistricts.

Headend or hub interconnection will be by cable or microwave relay. The basic problem is to add as little degradation as possible in transmitting signals between headends. Some loss of signal quality is certain to result no matter what technique is employed. Consequently, system designers must take interconnection losses into account in laying out the distribution system around each hub. In the worst case, signals travel from the far end of one system to its headend, then via the interconnection path to another headend, and finally downstream to the far end of the second system.

Cable interconnection uses a large-diameter coaxial cable, often called "supertrunk," to reduce losses. The larger the cable and the fewer the channels carried, the greater the distances between headends that can be connected with supertrunk. Supertrunk may be able to carry as many as 20 channels to hubs five to ten miles apart if each hub distribution system has been designed compatibly with the interconnection links. Supertrunk runs can be 15 miles or longer if only a few channels are carried. A separate cable must be installed between each pair of interconnected points, of course, and the total cost is proportional to the total number of cable miles required.
Microwave relay often has signal-quality and cost advantages over supertrunk when many points must be interconnected, or when hubs are more than 10 miles apart. The FCC has allocated a 250 MHz bandwidth in the microwave region for "Cable Television Relay Service," or "CARS" (an acronym from its former designation, Community Antenna Relay Service). Single-channel CARS band transmitters and receivers originally were developed to relay distant signals in a series of 25 to 30 mile "hops." No more than 10 television channels can be carried from one point to another with this equipment.

Since urban cable systems may need interconnection of more than 10 channels, manufacturers recently have developed equipment to transmit up to 18 channels from a central point to outlying hubs. The central multichannel transmitter is more expensive than a single-channel CARS band transmitter, but the overall system cost may be much lower if many interconnection channels are required.

The choice of technique thus involves the total number of interconnected headends, the number of channels carried in each direction, and the distances involved. Table 3 gives a brief comparison between cable and microwave interconnection. Some systems may use a combination of the two.

TECHNOLOGY FOR NEW SERVICES

Only a sampling of potential new cable services can be outlined here. Interested readers should consult the companion reports and the references listed at the end of the Handbook.

Pay TV and Private Channels

Pay television (or pay-cable, as the FCC now terms it) will be the first new service offered by most cable systems. Subscribers will watch pay-TV programs on their standard TV sets. However, new equipment will be needed to deny the programs to those who do not want to pay for them, and to record the proper charges for those who do.

The simplest technical approach is to send pay-TV programs on special frequencies—perhaps in the midband or superband—and furnish pay-TV subscribers with a special converter to receive them. To guard against subscribers tapping in for free, however, pay-TV promoters usually code or scramble the signals at the headend. A
Table 3
COMPARISON OF CABLE AND MICROWAVE INTERCONNECTION FEATURES

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Cable</th>
<th>Microwave (CARS)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Single-Channel FM</td>
</tr>
<tr>
<td>Channel capacity</td>
<td>25-35 channels per cable</td>
<td>Present equipment offers up to 10 channels</td>
</tr>
<tr>
<td>Capital cost</td>
<td>About $5,000-20,000 per mile (one cable in each direction, aerial installation)</td>
<td>$7,500-15,000 per channel</td>
</tr>
<tr>
<td>Reliability</td>
<td>Good (assuming maximum trunk cable distances not exceeded)</td>
<td>Good (subject to some atmospheric disturbance)</td>
</tr>
<tr>
<td>Maximum transmission distance for good quality signals</td>
<td>5-15 miles (depending on cable diameter and bandwidth to be carried)</td>
<td>20-15 miles</td>
</tr>
</tbody>
</table>

decoder as well as a converter is then required in the subscriber's pay-TV terminal. For further security the operator can install a switch inside the terminal that can be turned on and off only from the headend. He might even take the decoding terminal out of the home entirely and place it at the tap or at a feeder amplifier. Each step is successively more costly, but provides greater protection. The same cost and security considerations would apply to private channels that only certain subscribers are entitled to receive. Private channels might be needed for police training classes, for example, or for assuring privacy for banking transactions in a two-way system.

The simplest form of billing is to charge a fixed amount each month, no matter how much or how little pay-TV programming the subscriber watches. Both pay-TV promoters and viewers prefer, however, that charges be made on a per-program basis. To do this, the subscriber must be able to signal when he wants a particular program and to be billed accordingly.
In one currently demonstrated pay-TV system, subscribers purchase a "ticket"—shaped somewhat like a plastic credit card—in advance to watch particular pay-TV programs. When the program is shown, he places the ticket in a special slot in his pay-TV terminal. The ticket contains magnetic strips or holes that activate decoder circuits to provide an undistorted picture on the screen. Each program is encoded at the headend in a different manner, so that the subscriber must buy separate tickets for movies, hockey games, and other events. As a slight variant, the subscriber can telephone to find out the code for a particular program he wants to watch. His request is recorded for billing, and he is given instructions to punch out certain holes on a previously unused ticket. This allows him to make a last-minute decision to watch a pay-TV program.

Under a different scheme, the subscriber calls in for each pay-TV program he wants to see. No previously purchased tickets are required. Instead, a signal is sent from the headend when the subscriber's request is received to switch on the decoder circuits in his terminal. This approach requires more expensive terminals and head-end equipment, but it permits all pay-TV decisions to be made up to the last moment. Some pay-TV promoters consider that such impulse buying will be essential to their financial success.

These systems can be installed on a one-way cable system. In a two-way system, pay-TV requests could be sent upstream on the cable, eliminating the telephone return link. Subscriber billing also could be made simpler. Two-way pay-TV also has other advantages, but its equipment is considerably more expensive. The very fact that pay-TV can be installed more cheaply as a one-way service may prove a formidable barrier to the early installation of two-way home terminals.

Information Retrieval and Frame Storage

Subscriber response services will be the first two-way services developed for the home. A far richer range of services will be possible when the subscriber can request information to be shown on his TV set at his convenience. A few of the many potential examples include:

- Getting help in filling out an income tax form
- Buying theater tickets for Saturday night
- Obtaining, from the local Poison Control Center, the antidote to a poison a child has just swallowed
- Balancing one's checking account
• Seeing a map of alternate bus routes to the zoo
• Finding the last sale price of a specific stock
• Taking a computer-aided Spanish lesson

Information retrieval services will be considerably more complex and costly than subscriber response services. They require much more sophisticated computer and information storage facilities at the headend, and an even greater investment in computer programming or "software." They also demand a more sophisticated subscriber terminal that can display requested information as a still picture on the screen. The problem is somewhat like that of projecting different frames of a movie film on different screens, one frame at a time, for different viewers. One subscriber might want to see current football scores; the next, airline schedules; a third, children's clothes in a merchandise catalog; and so forth.

The technology exists for sending separate frames of information to different subscribers, and some prototype subscriber terminals (usually known as "frame grabbers" or "frame stoppers") have been developed. In the approach recently demonstrated in Reston, Virginia, up to 600 subscribers could in principle be served simultaneously over a single 6 MHz television channel. As might be expected, however, frame-stopping terminals would be very expensive today, even if two-way cable systems were operational. (The Reston demonstration used a telephone line for the return link.) Although development is proceeding rapidly, frame-stopping terminals are still likely to cost considerably more than a color television set in 1980. Consequently, information retrieval services on cable will be available to business, government, and institutional subscribers well before they are feasible in the home.

Electronic Mail and Facsimile

Another class of proposed cable services would deliver letters, newspapers, periodicals, and other documents to the home electronically rather than through the mails. Cable's huge capacity makes it potentially more attractive than the telephone network for large-scale, electronic document delivery. Using digital addresses, a personal letter could be sent to only one subscriber, while advertising flyers were distributed to an entire neighborhood.5

5 Whether subscribers want electronic mail delivery is certainly an open question. If electronic delivery were cheaper than the mails, subscribers might be even more flooded with unsolicited advertising than they are today. It may be useful to recall what one New Englander reportedly answered when offered the opportunity to subscribe to cable: "In my town we pay to have the garbage hauled out, not to have it hauled in."
Subscriber terminals are again the pacing technical problem. A frame-stopping device could display documents on the television screen, a few paragraphs at a time, if the subscriber did not want to keep a printed copy. However, proponents of electronic mail delivery generally assume that some sort of facsimile or “hard copy” device would be needed in the home. Developing such devices poses problems of paper storage and electric power cost, as well as that of building a cheap, reliable home unit. Facsimile devices coupled to cable should be available for institutional use by 1980, but they are even less likely to be used in the home by then than frame-stopping terminals.

High-Resolution TV

Cable systems eventually will deliver bigger, brighter, and sharper television pictures than are standard today. Although cable service is usually purchased to improve reception, television picture quality is limited intrinsically by the channel bandwidth and by the poor reception characteristics of most TV sets. Some observers believe that viewers will demand higher quality sound and pictures before they will pay for movies, operas, ballets, and other performances.

If demand warranted, these events could be transmitted over a 10 or 12 MHz channel and displayed on special “high-resolution” TV receivers. High fidelity, stereo sound could accompany the higher-quality pictures. A well-designed cable system could carry these channels without affecting transmission of the standard 6 MHz channels, whereas it would be very difficult to reallocate the broadcast spectrum to accommodate high-resolution television. High-resolution TV sets remain to be developed. The scientific principles are well known, but difficult technical and cost barriers remain in the way of producing high-resolution receivers for consumers. Moreover, standards for high-resolution TV would have to be adopted by program producers, cable distributors, and receiver manufacturers before the service could be provided. For these reasons, high-resolution TV in the home is not likely to be widely available before 1990, although it may be feasible in theaters well before then.

SUMMARY CHECKLIST

• Has the community determined how many headends or hubs it will need to assure good-quality service?
• Have the number and location of local studios been considered?

• Does the community want to encourage separate neighborhood programming through subdistricting?

• Have the advantages and costs of interconnection with other cable systems been considered?

• Have system capacity requirements for one-way and two-way services been thought through carefully? If the local franchise requires more capacity than the FCC rules specify, the community must have plans for its actual use.

• Has provision for later expansion been made in the initial system design? If not, rebuilding the system to add two-way capacity or extra downstream channels may be so costly as to inhibit development of new services.
Chapter 3

CABLE SYSTEM ECONOMICS

How much will it cost to build a cable system in your community? How will the money be raised to finance initial construction and expansion? How many households will subscribe for cable services? What will be the system’s sources of revenue and its major expenses? How profitable will it be?

There are no simple answers to these questions, nor any magic financial formulas that will apply to every cable franchise area. But some guidelines on the economics of cable television can be suggested. Local officials, civic leaders, and others can use these guidelines to begin sketching the likely development of cable in their communities. They will be better able to analyze financial data submitted by franchise applicants and to identify "blue sky" proposals. Moreover, they will have some basis for estimating the financial effects of different rate structures or of new cable services.

This chapter discusses three cable systems in three communities as economic models:

- System A, serving a town of 25,000 people, with poor to fair off-the-air television reception.
- System B, serving a medium-sized city of 150,000 people, with good off-the-air reception.
- System C, serving a city of 750,000 people, with excellent off-the-air reception.
Cable systems in these communities will be very different. Systems B and C, for example, are assumed to serve cities that fall within the 100 largest television markets in the United States. Consequently, they must provide at least 20 channels and otherwise conform to the 1972 FCC rules for cable in the top-100 markets. On the other hand, system A can build a lower-capacity system and deliver little more than improved reception service to subscribers.

Financial results for the three systems will also be different because each is built in a different environment. Comparing these systems directly can be misleading as comparing apples and oranges; the analysis thus is intended to illustrate differences as well as similarities among cable system operations.

The principal demographic assumptions for the three systems are shown in Table 4. Appendix C contains a full description of the assumptions made to generate the summary results in this chapter; the economic model used and other sources of financial information are described in the Handbook references.

<table>
<thead>
<tr>
<th>Item</th>
<th>System A</th>
<th>System B</th>
<th>System C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population in franchise area</td>
<td>25,000</td>
<td>150,000</td>
<td>750,000</td>
</tr>
<tr>
<td>Households in franchise area</td>
<td>8,000</td>
<td>48,000</td>
<td>240,000</td>
</tr>
<tr>
<td>In the 100 largest television markets?</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
</tr>
</tbody>
</table>

**HOW MANY SUBSCRIBERS?**

Cable system economics largely depend on how many households sign up for service. The percentage that do—usually called subscriber penetration or saturation—is the single most important factor in a system’s economic success or failure. With only 10-percent saturation, the cable operator’s investment stands largely idle; with 60-percent saturation, his system will be highly profitable. The breakeven point

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usually falls between 20 and 30 percent. Clearly, subscriber saturation must be predicted as accurately as possible to make reasonable financial projections.

But this is not an easy task. Estimates are reliable enough in the isolated communities where cable television began and prospered. But most of these communities—where off-the-air television reception is poor or only a few broadcast signals are available—have been wired already. The major U.S. metropolitan areas—the top 100 television markets—involves both the greatest interest in cable franchise decisionmaking and the greatest uncertainty in projecting subscriber saturation.

Saturation estimates generally derive from one or more of the following:

- Quantitative analysis of past cable system experience
- Market surveys
- Professional judgments based on past experience and local characteristics

Quantitative Analysis

Many of the factors influencing subscriber penetration can be identified from the experience of cable systems now in operation. A recent study by R. E. Park quantifies these factors. Using statistical techniques, Park finds the following relationships:

- The more television stations of various types a cable system carries, the higher its saturation.
- The fewer of each type of station receivable locally over the air, the higher the system's saturation.
- The farther away from television transmitters the system is, the higher its saturation.
- The more stations that broadcast on UHF rather than VHF channels, the higher the system's saturation, because of a variety of reception and tuning problems faced by UHF stations.
- The less the system charges for its service, the higher its saturation.
- The higher the average income of households in the community served by the system, the higher the system's saturation.
- The older a system is, the higher its saturation.
"There is nothing surprising about these relationships," Park points out; "they are all that one would expect." But by determining their relative importance in mathematical terms, Park's equations can be used to estimate cable saturation in other communities. Estimates for several U.S. cities, assuming distant signal importation according to the FCC rules, are shown in Table 5. Generally, Park's results suggest that cable television systems in the major markets will not be economically successful without new subscriber services.

However, these quantitative relationships provide only a single estimate of cable saturation, which must be viewed with caution. It should not be the sole basis for extended financial projections. This is particularly true for cable systems planned in major metropolitan areas, since these markets are unlike those from which the statistical data were drawn. An estimate based only on carriage of local and imported signals is likely to be too low for a major market cable system that will provide extensive local origination programming and new services such as pay television. Other factors that would tend to increase saturation level above that predicted by the model include the growth over time of household income, an increase in the number of households with color television sets, and aggressive marketing efforts in major market areas.

Since the subscriber fee is a significant determinant of penetration level, would a cable system do as well financially with a low monthly rate and more subscribers as it would with a conventional monthly fee of $4 to $6? This is an important question, since it is often argued that cable subscription fees should be kept as low as possible to maximize the number of subscribers and, hence, the overall benefits

<table>
<thead>
<tr>
<th>City</th>
<th>Market Rank</th>
<th>Saturation Estimate with Distant Signals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Detroit, Michigan</td>
<td>5</td>
<td>25%</td>
</tr>
<tr>
<td>Miami, Florida</td>
<td>21</td>
<td>23%</td>
</tr>
<tr>
<td>Dayton, Ohio</td>
<td>41</td>
<td>30%</td>
</tr>
<tr>
<td>Roanoke, Virginia</td>
<td>70</td>
<td>30%</td>
</tr>
<tr>
<td>Madison, Wisconsin</td>
<td>93</td>
<td>35%</td>
</tr>
</tbody>
</table>
from public services on cable. Unfortunately, analysis to date suggests that the net income from added subscribers will not make up for the revenue lost by lowering the monthly rate. Additional sources of revenue or some external-subsidy will be needed if subscriber fees are reduced much below the range of present experience.

Market Surveys

A survey of the local community's interest in and willingness to pay for cable television can contribute greatly to saturation estimates. Local attitudes can be brought out that would never be determined by examining statistical data from other communities. A survey in Dayton, Ohio, for example, showed that black city residents would be much more interested in cable if neighborhood programming were emphasized, while white suburbanites were more concerned with the prospects for more educational and cultural programs.

By themselves, however, market surveys may not give a reliable estimate of the real demand for a new and unfamiliar product or service. Despite the publicity cable television has received in recent months, many people may have no idea what cable service would mean for them. The reaction, when an interviewer describes potential cable services, can be a blank stare. The problem resembles that faced by market surveys for television receivers in the 1930s, when few people had ever seen broadcast video programs. Often, only 15 to 20 percent of those surveyed said they would pay sizable sums for "radio with pictures." On the other hand, more respondents may answer positively to a survey than will actually buy the service. For these reasons, professional advice is needed in framing survey questions, selecting the sample, conducting interviews, and analyzing the results. Social scientists at a nearby university, or professional market research firms can provide such advice to a community.

Who should conduct a market survey? Preferably the local government itself, or a broadly based consortium of community interest groups, if time and funds are available. A survey in a community of 500,000 people might require 700 interviews at a cost of $10,000, for example. Surveys conducted by franchise applicants or by special interest groups also can be useful, but they must, of course, be examined carefully for their objectivity and validity.1

1 For a good general treatment of survey techniques, see Carol Weiss and Harry F. Hatry, An Introduction to Sample Surveys for Government Managers, The Urban Institute, Washington, D.C., 1971.
Professional Judgments

Each applicant for the community's cable franchise will have made his own estimate of subscriber saturation. This estimate and the criteria on which it is based should be made publicly available as part of the franchise hearing proceedings described in Chap. 6. The community may also want a cable consultant to make an independent estimate of cable saturation, taking into account local factors as well as the consultant's previous experience with similar communities.

Yet no one—not even cable operators, consultants, nor financial analysts—knows for sure how many households will subscribe to cable in the major cities. Consequently, a community will be well advised to use as many of the above techniques as it can to derive a range of estimates. It should then examine financial projections assuming the highest, lowest, and "best" estimates in order to understand the system's financial sensitivity to saturation level. Saturation estimates for the three model systems after five years of operation (Table 6) were made by first computing results from the quantitative model, and then adding an expected saturation increase from new services, increased household income, and the other factors described above.

Table 6

<table>
<thead>
<tr>
<th>Assumptions and Results</th>
<th>System A</th>
<th>System B</th>
<th>System C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assumptions:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good-quality signals</td>
<td>2</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>available off-the-air</td>
<td>5</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>Signals available on cable</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Median household income</td>
<td>$9,500</td>
<td>$10,000</td>
<td>$11,000</td>
</tr>
<tr>
<td>Monthly subscriber fee</td>
<td>55</td>
<td>66</td>
<td>86</td>
</tr>
<tr>
<td>Results:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent of households subscribing</td>
<td>58%</td>
<td>30%</td>
<td>26%</td>
</tr>
<tr>
<td>Estimate including new services and other factors</td>
<td>60%</td>
<td>40%</td>
<td>35%</td>
</tr>
</tbody>
</table>
CAPITAL COSTS

The initial capital investment required to build a cable television system can be divided into four major categories:

- Headend and production facilities
- Cable distribution plant
- Subscriber equipment
- Pre-opening expenses

Headend and Production Facilities

Cable systems require a tower and antennas to receive signals off the air, signal processing equipment, and facilities and equipment for local program origination. They may also need microwave equipment to interconnect parts of the system, and they may purchase land and buildings. These are all fixed capital costs, independent of the total number of households that will subscribe for cable service.

Systems that serve larger areas or provide more channels and services will have larger fixed costs than smaller systems. In our model systems, fixed capital costs range from $85,000 in community A to $2,200,000 in city C. Yet on a per-household basis, the investment in fixed facilities decreases from $11 in system A to $9 in system C. Generally, fixed costs per household are lower in a large system than in a small one, since they can be spread over more households. This is known as an "economy of scale." However, capital cost economies of scale become relatively insignificant for cable systems serving more than about 10,000 subscribers.

The investment in local origination equipment and facilities also varies greatly among the three model systems. System A is assumed to spend $20,000 for automated time and weather equipment and minimal black-and-white origination facilities; system B invests $100,000 for a modest color production studio and one mobile unit; while system C spends $405,000 for a well-equipped central studio, four smaller production facilities, and three mobile units. In each case the investment is greater than that typically made today by a cable system of comparable size.

Cable Distribution Plant

The cable and its associated electronics account for the bulk of system capital investment. Most of this cost is in the electronics needed to amplify the television
signals along the route and in the labor required to install the system, rather than in the coaxial cable itself. Cable distribution plant cost is generally specified in dollars per mile of cable installed or in dollars per household passed by the cable. The major factors that influence these often-used figures are household density, overhead versus underground construction, geographic area, and system design.

**Household Density.** The denser the population, the more households a single mile of cable can serve. Household densities range from below 50 per street mile in suburban areas to more than 1000 per mile in some parts of New York City; 150 households per street mile is about average for cities of 500,000 to one million people.

**Overhead Versus Underground Construction.** In most communities cable is installed overhead on leased utility poles. Costs skyrocket when cable must be installed underground in utility ducts or in specially dug trenches. While overhead construction may run $4500 to $6500 per mile, the cost to install a single underground cable ranges from $8000 per mile in sparsely populated areas to more than $100,000 per mile in Manhattan.

Overhead cable construction requires coordination with electric and telephone utilities regarding pole lease rates, tree trimming, and rearrangement of wires to accommodate the coaxial cable. Making these arrangements can be expensive and time-consuming for the cable operator. Some cable systems have experienced delays of more than a year before utility pole negotiations were completed. Consequently, the local franchising authority will be well advised to monitor the "pole rights" negotiations between the cable system operator and the utilities that own the poles. Even after pole rights have been negotiated, the rate at which the other utilities make their poles ready may control the pace of cable system construction.

Communities may prefer underground cable for esthetic reasons. Economically, requiring cable to go underground is pointless if other utility lines are to remain overhead, but construction of a new cable television system often raises the issue of whether all utility lines should be placed underground. If they are, cable construction costs usually would at least double, even if the electric and telephone utilities share the undergrounding costs.

Overall, the percentage of cable distribution plant installed underground is the most critical factor determining system capital investment. The franchising authority and interested community groups should investigate the costs of underground construction carefully before a final cable system design is specified.

**Geographic Area.** The geographic area covered by the cable network can also strongly affect system cost. Irregularly shaped districts are more expensive to wire than compact ones, since they require more miles of cable trunk. For example,
wiring a small enclave of homes far from major residential areas can be an expensive undertaking.

Cable franchise areas are usually determined by municipal boundaries or by political considerations rather than by capital cost. For example, a city may want to create a separate cable district in a predominately minority community; or it may want to balance the socioeconomic characteristics of each franchise area. In either case, capital costs, the expected number of subscribers, and other economic factors should be studied carefully before a decision is made. Moreover, from a least-cost point of view, communities might consider establishing compact cable districts that would overlap political jurisdictions. Whether this would be practical politically is a local question to decide.

Geographic features such as mountains, rivers, and lakes will also influence total system cost, since they may necessitate laying additional miles of cable.

**System Design.** The choice of cable system design will affect distribution plant costs. Twenty-channel cable amplifiers are more expensive than twelve-channel amplifiers. A system with a second, “shadow” trunk costs about 15 percent more to install than a single cable system; a full dual cable system costs about 50 percent more; and so forth. System cost analysis involves tradeoffs among distribution plant, subscriber equipment, and fixed facilities, however. A dual cable system actually may be less expensive than a single cable system with converters, if a high percentage of households subscribe. Or equipment with the lowest initial cost may prove more expensive to operate and maintain. Such design tradeoffs are discussed more fully in a companion report.²

Least-cost construction is important, of course, but it is not the only factor in determining cable system design. A community may want to invest in more cable trunks than are minimally needed in order to distribute different programs to different neighborhoods. Or the community may want to install a separate cable for two-way video transmission among schools, hospitals, and other institutions. The cost of installing more capacity or additional options should be reviewed carefully before a system design is frozen.

Table 7 shows the investment in cable distribution plant for systems A, B, and C, and the assumptions used to derive them. System A has the lowest investment per household. The cost is highest for system B with two cables installed and a moderate household density. System C also has a dual cable plant, but its higher density lowers the cost per household.

² Carl Pilnick, *Cable Television: Technical Considerations in Franchising Major Market Systems*, The Rand Corporation, R-1137-NSF.
Table 7
CAPITAL INVESTMENT IN CABLE DISTRIBUTION PLANT

<table>
<thead>
<tr>
<th>Assumptions and Results</th>
<th>System A</th>
<th>System B</th>
<th>System C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assumptions:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of cables</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Converters required?</td>
<td>no</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>Channel capacity (nominal)</td>
<td>12</td>
<td>24</td>
<td>35</td>
</tr>
<tr>
<td>Two-way capacity?</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Households per street mile</td>
<td>75</td>
<td>100</td>
<td>150</td>
</tr>
<tr>
<td>Miles of cable plant</td>
<td>107</td>
<td>480</td>
<td>1600</td>
</tr>
<tr>
<td>Cost per mile, overhead</td>
<td>$4,500</td>
<td>$7,500</td>
<td>$8,500</td>
</tr>
<tr>
<td>Cost per mile, underground</td>
<td>$10,000</td>
<td>$15,000</td>
<td>$25,000</td>
</tr>
<tr>
<td>Percent of cable plant constructed underground</td>
<td>2%</td>
<td>5%</td>
<td>5%</td>
</tr>
<tr>
<td>Results:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distribution plant investment</td>
<td>$497,000</td>
<td>$3,818,000</td>
<td>$15,648,000</td>
</tr>
<tr>
<td>$ per household</td>
<td>$62</td>
<td>$80</td>
<td>$85</td>
</tr>
</tbody>
</table>

Subscriber Equipment

Subscriber equipment costs must be considered separately from other capital cost items, since they are determined by the number of households that sign up for cable service. Each subscriber will have one or more cable drop lines running from the cable distribution plant to his home and connected to his television receiver. The cost of materials depends on the length of the drop; materials can cost as little as $5 for a single overhead drop, or more than $50 for dual underground drops. Converters for each television set must also be included as subscriber equipment when they are required. Converters, as described in Chap. 2, cost about $20 to $40 each today.

Pre-Opening Expenses

A number of other costs will be incurred during the franchise and system construction phases. These include legal fees and other organization expenses, the costs of preparing a franchise application, and salaries of employees hired before the
system begins operation. Such items generally are considered part of the overall capital investment in the system.

The total capital costs for the three model systems are shown in Table 8. The three systems are best compared on a cost-per-subscriber basis, assuming the same percentage of subscribers in each case. Here we use 30%, 50%, and 100%-percent saturation in each system for comparison, although the actual percentages will vary considerably. Capital costs per subscriber decrease rapidly as saturation increases, as shown graphically in Fig. 13.

Table 8
TOTAL CAPITAL INVESTMENT

<table>
<thead>
<tr>
<th>Item</th>
<th>System A</th>
<th>System B</th>
<th>System C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed facilities</td>
<td>85,000</td>
<td>364,000</td>
<td>2,299,000</td>
</tr>
<tr>
<td>Cable distribution plant</td>
<td>697,000</td>
<td>3,818,000</td>
<td>15,648,000</td>
</tr>
<tr>
<td>Subscriber equipment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30% saturation</td>
<td>33,000</td>
<td>361,000</td>
<td>5,310,000</td>
</tr>
<tr>
<td>50% saturation</td>
<td>51,000</td>
<td>559,000</td>
<td>8,670,000</td>
</tr>
<tr>
<td>100% saturation</td>
<td>84,000</td>
<td>923,000</td>
<td>15,695,000</td>
</tr>
<tr>
<td>Pre-opening expenses</td>
<td>46,000</td>
<td>100,000</td>
<td>200,000</td>
</tr>
<tr>
<td>Total capital investment</td>
<td>653,000</td>
<td>4,843,000</td>
<td>23,357,000</td>
</tr>
<tr>
<td>30% saturation</td>
<td>673,000</td>
<td>4,841,000</td>
<td>26,717,000</td>
</tr>
<tr>
<td>50% saturation</td>
<td>708,000</td>
<td>5,205,000</td>
<td>34,542,000</td>
</tr>
<tr>
<td>Capital investment per subscriber</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30% saturation</td>
<td>273</td>
<td>322</td>
<td>324</td>
</tr>
<tr>
<td>50% saturation</td>
<td>168</td>
<td>202</td>
<td>223</td>
</tr>
<tr>
<td>100% saturation</td>
<td>86</td>
<td>108</td>
<td>144</td>
</tr>
</tbody>
</table>

Obviously, the results shown in Table 8 and Fig. 13 depend entirely on the assumptions used to derive them. For example, the capital cost difference between major market systems B and C is due principally to the assumed need for converters in system C. Other assumptions are listed in Appendix C. These are not expected to describe any real community exactly. Nonetheless, a number of general points

50
Fig. 13—Cable system capital cost dependence on subscriber saturation
can be drawn from the analysis used to obtain these results, and from similar studies listed in the Handbook references:

1. Cable television is capital intensive. A capital investment of roughly $100 per household, or $200 per subscriber with 50-percent saturation, will be required to build a 20-channel cable system with minimal two-way capability in the major metropolitan areas.

2. Most of the capital investment goes for equipment and facilities shared by subscribers. Thus, on a per-subscriber basis, capital costs decrease significantly with increasing saturation.

3. Capital costs are sensitive to household density and the amount of underground construction required.

4. All other things being equal, per-household or per-subscriber capital costs are lower for large systems than for small ones. (In our three models, however, other factors dwarf these economies of scale.)

From a capital cost standpoint, economies of scale may make it advantageous for small, contiguous communities to join together in building a common cable network. This may be particularly important for suburban communities within the top 100 markets. On the other hand, a large city can be broken down into several franchise districts without a significant increase in initial construction cost. The choice of franchise size and boundaries is principally a political choice, as discussed in Chap. 5.

OPERATING REVENUES AND EXPENSES

Up to now, cable systems have received the bulk of their revenue from monthly subscriber fees for distributing conventional television programming. Many people believe, however, that new services on cable will soon be more important sources of income in the larger systems. For example, pay television on cable is expressly permitted under the 1972 FCC rules. In the next few years, most high-capacity cable systems will offer first-run movies, championship boxing matches, operas, and other special events to their subscribers for an extra fee for each program watched. Similarly, channel leasing may become a lucrative business. Eventually, cable systems may offer subscribers a low basic monthly rate—although probably not zero—and
charge for each additional service. Subscribers would then receive an itemized monthly bill listing the pay-TV programs, educational courses, and other cable services they used.

Cable operators often describe this as the "give away the razor to sell the blades" sales technique. It is probably a decade away for most cable systems, however. In estimating revenues for the next few years, it will be more realistic to continue to base revenue projections largely on subscriber fees for television reception service plus the development of pay-TV on cable. This approach is followed for the three systems described in this chapter. Table 9 shows these revenue projections for each system's fifth year of operation, after subscriber saturation has reached a fairly steady level.

Table 9
 ANNUAL CABLE SYSTEM REVENUES IN FIFTH YEAR OF OPERATION

<table>
<thead>
<tr>
<th>Item</th>
<th>System A</th>
<th>System B</th>
<th>System C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base subscriber fee</td>
<td>288,000</td>
<td>1,382,000</td>
<td>5,424,000</td>
</tr>
<tr>
<td>Multiple outlets</td>
<td>17,000</td>
<td>104,000</td>
<td>497,000</td>
</tr>
<tr>
<td>Installations</td>
<td>1,000</td>
<td>5,000</td>
<td>129,000</td>
</tr>
<tr>
<td>Reconnections</td>
<td>3,000</td>
<td>12,000</td>
<td>42,000</td>
</tr>
<tr>
<td>Local advertising</td>
<td>4,000</td>
<td>23,000</td>
<td>91,000</td>
</tr>
<tr>
<td>Pay-TV and other new services</td>
<td>0</td>
<td>29,000</td>
<td>113,000</td>
</tr>
<tr>
<td>Channel leasing</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>313,000</td>
<td>1,555,000</td>
<td>6,206,000</td>
</tr>
<tr>
<td>Revenue per subscriber</td>
<td>65</td>
<td>81</td>
<td>82</td>
</tr>
</tbody>
</table>

Revenues

**Basic Subscriber Fee.** Subscriber rates in existing cable systems generally fall between $4 and $6 per month. A $5 monthly rate is considered average. The municipally owned system in Frankfort, Kentucky has about the lowest rate in the United States—$2.50 per month.
A low subscriber rate certainly is an important objective in franchising, but it is not the only goal. The investment in a high-quality cable system, the cost of local origination facilities, and the development of new services must in the end be supported by subscriber or user payments. In cable, as in all economic enterprises, better service usually implies a higher cost. Thus, a city that bases its franchise decision entirely on the lowest subscriber rate offered, as many have done, generally does so at the penalty of fewer and lower-quality services. Striking a balance between maximizing cable services and minimizing rates seems the preferable course for most communities.

The 1972 FCC rules described in Chap. 5, requiring 20-channel cable capacity and two-way capability in the 100 largest television markets, almost surely will increase the monthly subscriber rate for service in these markets above the present average. In this chapter, we assume a $5 basic monthly rate in community A and a $6 monthly rate in major market systems B and C.

Multiple Outlets. Cable systems typically charge $1 or $2 more for multiple outlets, similar to the monthly charge for additional telephone extensions. Between 10 and 30 percent of subscribers can be expected to sign up for a second outlet. This can be a profitable revenue source if converters are not required, since the incremental cost to the system of providing multiple outlets is very small. An additional $1 per month is sometimes charged for each extra converter needed.

Installation and Reconnect Fees. Most cable systems charge $5 to $30 for initial hookup, and $3 to $10 for a reconnection. Some franchise ordinances have insisted on a low installation charge, or have even waived the installation fee altogether. Requiring free installation in the franchise is not usually a sound policy decision, however, since it encourages subscribers to connect and disconnect from the system frequently—adding further operating expenses that must be met by higher subscriber fees or from other revenues. Nonetheless, commercial cable operators often waive or substantially reduce installation fees as a promotional device to attract subscribers. Consequently, installation and reconnect fees—after promotion and selling costs are subtracted—are not generally significant sources of income.

Local Advertising. Advertising on local cablecasting channels is often cited as an important new revenue source for cable systems. The FCC rules expressly permit advertising on locally originated programs. Thus, one might project large revenues from local advertising if many channels were used for program origination by the cable operator.

Up to now, however, cable systems have not been particularly successful in selling advertisements on their cablecasting channels. In part, this may be because
much local programming has been of poor quality, or because the cable system has not sold local advertising aggressively enough. But more important, cable systems have not yet had enough viewers watching cablecasting channels to generate much advertising revenue.

A brief calculation illustrates the problem. Advertisers on local broadcast television stations now pay an average of about $4 per commercial minute for every 1000 viewing households. Cable operators should be able to charge somewhat more per viewer than broadcasters since they can better pinpoint their audience. (Similarly, special audience magazines like Business Week and Playboy can charge higher advertising rates per reader than can Reader's Digest and other mass audience periodicals.) Assuming that twice the broadcast rate per viewer would apply to cable advertising, and assuming that 5 percent of cable subscribers were watching a local origination channel (probably an optimistic assumption), then a 10,000-subscriber cable system could charge $4 for each one-minute spot. If the cable system sold four spots per hour and originated 20 hours each week, its total annual revenue from advertising would amount to only $1.66 per subscriber. And this would be gross income; sales commissions and the direct cost of an advertising sales staff would make net revenues even lower.

Many cable systems have sold some advertising at higher per-viewer prices, and systems in Pittsfield, Massachusetts and Santa Rosa, California have reported sales at an annual rate of $2 per subscriber. But even at that level, local advertising amounts to a small percentage of total system revenues.

New Services. Much of the promise of cable relates to the new services it will provide beyond conventional television distribution. Services such as pay television, educational extension classes, merchandising, and the like are beginning to be offered by cable operators around the country. They are not yet an important source of cable revenues, however.

Projecting anticipated revenues from new services is extremely difficult. There are as yet no data on consumer demand for new services that would permit realistic revenue projections to be drawn, although some long-range market forecasts have been made. Until more experience is available, communities should not anticipate large revenues from new services in the next five years.

Pay television is the one exception. Recent experiments with pay television in hotels and motels, and some early market research studies, indicate there will be a significant consumer demand for first-run movies, sporting events, artistic and cultural events, and educational programs on a pay basis. The data suggest that perhaps 20 to 25 percent of cable subscribers will pay $5 to $10 per month extra for
various pay-TV programs. The cable operator is likely to net only 10 to 15 percent of these gross revenues, which means he may average an extra $2 to $3 annually per subscriber. Although this amount is not much more than he might net from an aggressive local advertising campaign, pay television will serve to build his subscriber base as well as to increase total revenue per subscriber.

**Channel Leasing for Commercial, Educational, and Government Services.** Financial projections for cable television systems are usually based on services to residential subscribers. A very different way of looking at cable system economics is to assume that the system basically serves government and business customers, with residential subscribers playing a less important role. This is, in part, the view taken in recent studies of the prospects for cable in Washington, D.C. and Detroit, Michigan. Some have suggested that an entirely separate cable system be built to serve institutional users.

If government and business subscribers were to assume the basic capital and operating costs of a cable system through channel leasing, then rates to residential subscribers might be lowered commensurately. Today, however, it is doubtful whether the demand for cable communication services by business and government users is sufficient to cover the cost of building and operating a cable system. The question also arises whether institutional users should subsidize services provided to the home. This issue has been debated for many years in relation to the pricing of telephone services. There are unlikely to be any easy answers for cable, either, when business, educational, and government users share facilities and costs with home subscribers.

The model systems described in this chapter include no net revenues derived from channel leasing to business, educational, or governmental users. That is, it is assumed that any revenues received from these institutional users will just cover the cost of providing channel capacity to them. Although this assumption may be far too conservative for the cable systems of 1980 and beyond, it seems a realistic one for the next five years.

**Operating Expenses**

Like all businesses, a cable system must meet its payroll, carry insurance, lease office facilities, pay for legal and other professional services, advertise and promote its business, bill its customers, make provision for bad debts, and pay property and corporate income taxes. Operating costs more peculiar to cable television include:
- System maintenance
- Subscriber service calls
- Vehicle operation
- Utility pole and duct rental
- Franchise fees
- Copyright payments
- Costs to bring in distant signals
- Local origination costs

Operating expenses do not include interest payments, depreciation charges, or corporate income taxes. Copyright payments for program materials have not yet been required for programs received off the air or imported from other cities, but some payment will be required when new copyright legislation is passed. The cost of distant signal importation and local origination will vary enormously, of course, depending on the distance that imported signals are carried and the extent to which local programming is produced. Operating costs for the three model systems are itemized in the Appendix; more complete discussions can be found in the Handbook references.

An industry rule of thumb is that highly profitable cable systems keep operating expenses to 50 percent or less of system revenues. A system whose steady-state operating expenses run above 65 percent of revenues is probably in financial trouble. Of course, since revenues depend on the number of cable subscribers, operating expenses will consume a higher percentage of revenues in the first few years of system operations.

A large cable system usually can be operated more efficiently than a small one. However, operating economies of scale decrease in importance for systems with more than about 10,000 subscribers, just as do capital cost economies. It is too early to judge the economies of scale in providing new services on cable, but developing them clearly will be more feasible if spread over a larger subscriber base.

SYSTEM PROFITABILITY

In evaluating a business opportunity, investors usually look first at the company's net profit after all taxes have been paid. Yet cable television systems often have high market values even when they report small or no earnings. This is because
investors are betting on the cable system earning more in the future, and because net profit alone may not be adequate to judge a system's present worth. In cable today, the terms "operating income" and "cash flow" are used as often as profits to measure financial success.

Operating Income

Cable operating income is the difference between operating revenues and expenses, before interest payments, depreciation charges, and income taxes. This is a common measure by which cable systems can be compared, since it does not depend on the capital structure of the business or the method by which plant and equipment are depreciated. Mergers or sales of cable systems are often negotiated on the basis of some multiple times the system's operating income.

Operating income for the three model systems in their fifth year of operation is shown in Table 10. The fifth year is chosen as a time beyond the initial buildup period. The full ten-year projections in the Appendix show that systems A and B have indeed nearing steady-state operations by this time, but large-city system C is still developing its subscriber base. Operating expenses for system C thus eat up a considerably greater percentage of system revenue.

Cash Flow and Net Profit

Cash flow is defined as operating income less interest payments, which is the same as net pretax profit plus depreciation. Depreciation, of course, is a charge

Table 10

<table>
<thead>
<tr>
<th>Item</th>
<th>System A</th>
<th>System B</th>
<th>System C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenues</td>
<td>$313,000</td>
<td>$1,555,000</td>
<td>$6,206,000</td>
</tr>
<tr>
<td>Operating expenses</td>
<td>$167,000</td>
<td>$869,000</td>
<td>$3,781,000</td>
</tr>
<tr>
<td>Operating income</td>
<td>$146,000</td>
<td>$686,000</td>
<td>$2,419,000</td>
</tr>
<tr>
<td>Expenses as % of revenues</td>
<td>53%</td>
<td>56%</td>
<td>61%</td>
</tr>
</tbody>
</table>
against earnings that is meant to account for the obsolescence of the cable plant and other capital assets. Although cable plant and equipment usually is depreciated over an eight-to-fifteen-year period, the choice of depreciation period is largely a matter of business judgment. Further, the amount of depreciation taken need not represent a real decrease in value of the physical assets. The cable plant may, in fact, increase in market value while it is being depreciated. Here, as in many other ways, the economics of cable television bear a close resemblance to the economics of commercial real estate.

Table 11 presents cash flow and pretax profit results for the three model systems in the fifth year. System B, for example, generates $312,000 in depreciation for this year. But this sum need not be tucked away in a bank vault to await the time when new equipment must be purchased. Rather, the funds could be used to extend the system, to develop new services, or to acquire other operating cable systems.

<table>
<thead>
<tr>
<th>Item</th>
<th>System A</th>
<th>System B</th>
<th>System C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating income</td>
<td>146,000</td>
<td>686,000</td>
<td>2,419,000</td>
</tr>
<tr>
<td>Less interest</td>
<td>21,000</td>
<td>157,000</td>
<td>926,000</td>
</tr>
<tr>
<td>Cash flow</td>
<td>125,000</td>
<td>529,000</td>
<td>1,493,000</td>
</tr>
<tr>
<td>Less depreciation</td>
<td>68,000</td>
<td>312,000</td>
<td>1,578,000</td>
</tr>
<tr>
<td>Pretax profit</td>
<td>57,000</td>
<td>217,000</td>
<td>(65,000)</td>
</tr>
<tr>
<td>Pretax profit as</td>
<td>15%</td>
<td>9%</td>
<td>negative</td>
</tr>
<tr>
<td>percent of equity</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Investors, financial analysts, and cable executives often talk of cable television as a "cash flow business." This is because the large depreciation charges generated each year can, like profits, be spent for system expansion or for any other corporate purpose. It may also be because cash flow is always larger than net profit and
therefore more pleasant to discuss. Indeed, the use of cash flow rather than profits should not obscure understanding of where the flow comes from. Cable systems generate large depreciation charges precisely because they require large capital investments, and the larger a cable system grows, the more capital it will need. One expects cable communications to become even more capital intensive as new cable services are developed—just as the telephone industry's need for capital has increased dramatically as the industry has matured.

**Profitability and Market Value**

Table 12 shows that systems A and B are earning profits in the fifth year, but system C is not yet in the black. Still, this does not mean that system C has little value while it is losing money. Market value for cable systems usually is assessed on the basis of either operating income or the number of real and potential subscribers. Using two different industry rules of thumb, systems are worth 7 to 12 times annual operating income, or else $300 to $500 per subscriber. The low end of the range is used for mature, saturated systems; the high end for new, developing systems that have not yet reached their full potential. If a market value of 10 times operating income were used, for example, the three model systems would be worth $1.46 million, $5.86 million, and $24.2 million, respectively, after five years.

<table>
<thead>
<tr>
<th>Item</th>
<th>System A</th>
<th>System B</th>
<th>System C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total capital investment</td>
<td>$768,000</td>
<td>$4,940,000</td>
<td>$23,215,000</td>
</tr>
<tr>
<td>(equity plus debt)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>System value after five years</td>
<td>$1,455,000</td>
<td>$6,858,000</td>
<td>$24,185,000</td>
</tr>
<tr>
<td>(10 times operating income)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annualized rate of return on total</td>
<td>22%</td>
<td>14%</td>
<td>4%</td>
</tr>
<tr>
<td>capital</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annualized rate of return on equity</td>
<td>29%</td>
<td>17%</td>
<td>3%</td>
</tr>
<tr>
<td>(1/1 debt/equity ratio)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 12

**RATES OF RETURN**
Cable investors today base much of their anticipated return on gains in system market value rather than on operating earnings. According to our model, for example, system A requires an initial capital (equity plus debt) investment of $758,000. After five years, that investment is worth $1,455,000. Compounded annually, the increase amounts to a 22-percent rate of return on total capital (Table 12). The equity investors who bear the higher risk realize a 29 percent return. This high return suggests why cable television has been such a profitable business in the past. Only three cable systems are known to have gone out of business in the past twenty years.

On the other hand, equity investors in system C receive only a 3-percent rate of return in the first five years. The rate of return is especially sensitive to assumptions used in the model, as illustrated in Appendix C, and small changes in the assumed saturation level would make large differences in the resulting return. For example, system C investors would have a negative rate of return after five years if subscriber saturation were only 30 percent instead of 35 percent. In fact, cable looks like a risky business in most cities. Those who put up the initial capital to build an urban cable system—whether they are wealthy private investors, large corporations, neighborhood residents, or the city itself—stand a real risk of losing much or all of their investment. Of course, they also stand to make large gains if the system reaches 45 or 50 percent saturation.

If big-city cable systems are so risky, why are so many large corporations prepared to bid for urban franchises? Why do investors pay such high prices today for cable television stocks? There seem to be three principal reasons. First, many corporations and individuals are willing to pay a steep premium to "get in on the ground floor" of what will eventually be a major industry. Second, they may anticipate that lucrative markets for new services will have developed by the time cable systems are built in the major cities. In 5 to 10 years, they may reason, added revenues from such services as pay television, remote shopping, and educational courses at home will reduce much of the risk in building large city systems. Third, high risk seldom seems to deter investors who see the potential of high profits. Psychologically, most people and corporations expect the best from their new ventures and tend to discount the risks. But one should not pretend that the risks are not there. In the major markets, cable television is certainly not yet a utility with steady, foreseeable profits.

Indeed, urban cable systems face a real chicken-and-egg problem. Until new services provide significant new sources of revenue, cable franchises in the larger cities may not offer sufficient returns to warrant large-scale commercial construc-
tion. And, until systems are built and large subscriber markets are assembled, new services will not be profitable. The result may be a far slower pace of system construction in the major markets than previously, glowing accounts of cable have projected.

As a partial solution to the chicken-and-egg problem, federal subsidies have been suggested to encourage cable construction in the inner cities and government-backed New Towns. Proponents argue that this may be the only way to promote new public services on cable in the near future. Services such as instruction in the home and medical telediagnosis will be feasible only when large numbers of subscribers are wired to receive them. Moreover, subsidy of the basic cable connection may be necessary for low-income families if they are to benefit from such services. For rural areas, recently proposed legislation would create a Cooperative Cable Administration that could offer low-interest loans for building rural cable systems that commercial operators find uneconomic to wire. Similar federally backed loans for rural electric and telephone construction have been available for many years from the Rural Electrification Administration. Yet, although government subsidies for cable development may someday be commonplace, they are unlikely to be available in the near future. Demonstration projects to test the feasibility of new services will be the more likely focus of federal support in the next few years.

Finally, it is interesting to compare the rates of return from current cable television operations with those in other industries. (See Table 13.) The five largest cable television companies, while reporting increased profits in 1971, averaged a

<table>
<thead>
<tr>
<th>Company or Industry</th>
<th>1971 Net Operating Income as Percent of Stockholder's Equity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fortune's 500 largest U.S. corporations</td>
<td>9.1</td>
</tr>
<tr>
<td>AT&amp;T</td>
<td>8.5</td>
</tr>
<tr>
<td>MCI</td>
<td>20.2</td>
</tr>
<tr>
<td>TelePrompTer</td>
<td>8.0</td>
</tr>
<tr>
<td>S largest cable companies</td>
<td>13.3</td>
</tr>
</tbody>
</table>

Table 13
RATE OF RETURN COMPARISONS
lower rate of return on their stockholders' equity than did Fortune's 500 largest corporations. TelePrompTer, the industry leader, earned a respectable 13.3 percent on equity—more than most regulated utilities such as AT&T, but well below the returns reported by many "growth" companies such as Xerox. Again, the attractiveness of cable television as an investment rests on the promise of future earnings rather than on current system profitability.

RAISING CAPITAL FOR CABLE

Cable television has been known as a "leveraged" industry. That is, investors in a cable system have been able to put up a relatively small amount of money in shares of stock and then borrow the additional funds needed to construct the system. The cable plant itself has served as valuable collateral for the loan. Investors often could borrow three or four times their equity investment—giving them prospects for very high gains if the system were successful. High leverage has been possible particularly in smaller towns and cities where local banks knew the cable owners personally and where penetration levels and revenues for the system could be projected with reasonable confidence. Cable equipment manufacturers also have made large loans to cable operators in order to finance sales of their products.

Such high debt-to-equity ratios are unlikely for cable systems built in the cities. One cannot project cable's growth in the major markets as confidently as in the more isolated areas, where cable has been most successful in the past. Moreover, the large sums needed to build urban cable systems make it difficult for these systems to be owned entirely by local investors. Instead, the large, publicly owned multiple-system operators (MSOs) are likely to finance the major share of new cable construction. The rise of the cable MSOs is discussed in the next chapter.

Certainly, a community will want to know where the money will come from to build its cable system. Cable MSOs raise funds for new system construction largely in the public capital markets, and their financial statements are a matter of public record. But other means of private financing, such as limited partnership investments and corporate sale/leaseback arrangements, increasingly are being used for cable construction. Communities should insist on full disclosure of financial interests and system financing plans for all franchise applicants.
SUMMARY CHECKLIST

- Has the community independently evaluated the capital cost and projected financial operations of its cable television system? It should not rely solely on projections supplied by franchise applicants, but should measure these projections against its own estimates. This need not require a detailed and expensive study; rough calculations often can suffice. However, financial projections should include breakdowns of:
  - capital costs
  - subscriber saturation
  - anticipated revenues
  - operating expenses
  - operating income and net profit
  - sources and uses of funds

- Has the community gathered and examined the available financial models and economic data about cable system operations? This information makes it possible for local officials and private citizens to form their own judgments about the economic prospects for cable in their communities. During the planning and franchising processes, however, most cities will want to have the advice of independent experts.

- Have estimates been prepared of the percentage of households that will subscribe to cable and the sensitivity of financial results to this figure? Subscriber saturation is the most important single factor in determining system success or failure and the most difficult to forecast in major market systems. Yet a range of estimates can be derived from the experience of other communities, household surveys, and expert judgments.

- If the community is small, and particularly if it is in a major market, has it investigated the economies of scale that would be realized by common or coordinated franchising with neighboring towns?

- Conversely, have the economic consequences of forming multiple cable districts within the community been investigated?

- Have the costs of, and projected revenues from, local origination and new services been examined carefully so that unrealistic demands will not be
made? Remember that programming and other software generally will cost much more than hardware. Unless a community has good reason to think otherwise, income from new services other than pay television should not be expected to contribute heavily to system revenues in its early years.

- Has the community secured full information from each franchise applicant on his financial status and how he intends to finance system construction?
Chapter 4

OWNERSHIP OPTIONS

The basic ownership issue a community will face is whether it should follow the standard pattern of franchising its cable system to a private operator. Choosing an experienced operator to build the city’s cable system is probably the most reliable approach, and certainly the least controversial. Yet many contend that community control is greater with public or noncommercial ownership, and that surpluses generated by the system can be turned directly to community benefits.

With growing public awareness of cable, ownership will perhaps be the most emotionally charged topic a community will confront in its cable television decision-making. This chapter attempts to clarify the issues as well as promote better-informed debate by describing cable ownership patterns as they have evolved thus far and by outlining the ownership options that communities can choose from.

COMMERCIAL OWNERSHIP

The growing cost and complexity of cable systems in the major cities influence cable ownership in two important ways. First, private ownership continues to predominate, with capital-raising the principal barrier to public or noncommercial systems. Second, private ownership is increasingly concentrated in a few large national corporations.
The Rise of the Cable MSOs

Nearly all cable television systems in the United States—more than 97 percent—are owned by private, profit-seeking businesses. Over the past five years, ownership has become concentrated in the hands of multiple system operators (MSOs), which have grown largely by acquiring smaller cable systems. As of September 1972, the 10 largest cable MSOs, listed in Table 14, served 44 percent of the estimated 6.5 million subscribers in the United States. The top 25 MSOs served 59 percent. Moreover, 33 of the 50 largest U.S. cable systems, or about two-thirds, are owned by the top ten MSOs.1

The growth of the major MSOs over the past few years is due to the same forces that favor bigness in most U.S. industries. First, cable television has grown large enough to gain the attention of corporate managers and financiers. Although many cable systems in small towns have been very profitable for more than a decade, the industry has become known as a vehicle for public and corporate investment only in the past five years. Not until 1971 did a major cable television MSO—Viacom—gain listing on the New York Stock Exchange.

Second, MSO growth has been spurred by the interest of other communications companies in cable. Warner Communications—the parent company of Warner Brothers movie studios—entered the cable television business late in 1971. It now is the third largest MSO. Cox Broadcasting would be the largest shareholder in Cox American, a merger that would create the second-ranked MSO.2 Time-Life, Inc., faced with a choice between owning broadcasting stations or cable systems, chose to concentrate on cable. It now owns the eleventh largest cable MSO. All told, broadcasters, publishers, film producers, and theater owners hold ownership shares in more than half (56 percent) of all cable systems in the nation.

But the largest factor in MSO dominance is money. As cable systems grow larger and require greater investments, small corporations and private individuals find it more difficult to come up with the required capital. The data in Chap. 3 showed that building a cable system in a major city will require a capital outlay of tens of millions of dollars. Overall, the cable industry expects to invest at least $250 million each year to build new cable plant. Large corporations, with their access to

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1 The 50 largest U.S. cable systems are listed in Appendix B.
2 The merger of Cox Cable Communications, Inc., and American Television & Communications Corporation to form Cox American has been approved by stockholders of both companies but not yet completed due to antitrust objections brought by the U.S. Department of Justice.
Table 14
THE TEN LARGEST CABLE TELEVISION SYSTEM OPERATORS

<table>
<thead>
<tr>
<th>Rank</th>
<th>System Operator</th>
<th>Number of Subscribers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>TelePrompTer</td>
<td>685,000</td>
</tr>
<tr>
<td>2</td>
<td>Cox American</td>
<td>530,000</td>
</tr>
<tr>
<td>3</td>
<td>Warner Communications</td>
<td>375,000</td>
</tr>
<tr>
<td>4</td>
<td>Tele-Communications</td>
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</tr>
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<td>5</td>
<td>Viacom</td>
<td>185,000</td>
</tr>
<tr>
<td>6</td>
<td>Sammons Communications</td>
<td>183,000</td>
</tr>
<tr>
<td>7</td>
<td>Cablecom-General</td>
<td>178,000</td>
</tr>
<tr>
<td>8</td>
<td>Communications Properties</td>
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<td>119,000</td>
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<tr>
<td>10</td>
<td>LVO Cable</td>
<td>109,000</td>
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The merger of Cox Cable Communications, Inc., and American Television & Communications Corporation to form Cox American has been approved by stockholders of both companies but not yet completed due to antitrust objections brought by the U.S. Department of Justice.

Public and private capital markets, are best able to provide investment dollars of this magnitude.

Finally, the financial institutions that raise and lend money for cable system construction also prefer to deal with large corporations. Large banks, insurance companies, and investment banking firms find it more profitable to make one large loan than several smaller ones. Moreover, the large cable MSOs have longer operating records and more experienced management to lend confidence that a long-term loan will be repaid.

Limits on Ownership Concentration

Some have suggested that MSO growth be restricted so that one or a few companies do not completely dominate the industry. This is the position taken in the Sloan Commission report:
We recommend that a limit be placed upon the number of cable subscribers served nationally by any single individual or enterprise. That limit might be set at 10 percent of all households within the reach of cable at any given time.

Today, only TelePrompTer, with a 10.5 percent market share, would be affected by such a limitation.

On the other hand, one of the industry's past problems is that cable companies have been too small to compete effectively with broadcasters or to invest much money in the development of new services. TelePrompTer is not a large company by American industry standards; its total national revenues are less than those of the broadcast stations serving Philadelphia. McGraw-Hill, a single publishing company, is larger than the entire U.S. cable television industry. At this stage in cable's development, the emergence of a few large, well-financed corporations, able to invest sizable sums in programming and new services, seems more likely to spur innovation in the industry than to retard it.

Issues of MSO Dominance in Cable

While perhaps inevitable in the development of the industry, the growing dominance of the large cable MSOs nevertheless presents several issues for communities to consider. These include cross-ownership restrictions, preferences for local ownership, and encouragement of minority ownership.

Cross-Ownership Restrictions. One issue is the extent to which cable systems should be owned by companies with other interests in the communications field. In a nation increasingly dependent on television for news and information, a single entity's control of both over-the-air broadcasting and cable distribution may create too great a concentration of political and economic power. As a result, the FCC has banned cable system ownership by broadcast television stations serving the same community and by television networks. The Commission has also prohibited telephone companies from owning cable television systems in their telephone franchise areas and is considering cross-ownership restrictions against newspapers and cable systems in the same community.

At the local level, communities must decide whether the FCC's cross-ownership restrictions should be tightened to include other categories, or perhaps loosened. For example, the community may want to keep a large local newspaper from controlling its cable system, even though the FCC does not yet prohibit such cross-ownership.
On the other hand, a local educational television (ETV) station might want to own a share in the cable system. At present, ETV stations fall under the FCC's cross-ownership prohibition, so that a special waiver from the Commission would be needed. Other cross-ownership restrictions in a local franchise might require a "special showing" to justify them. Waivers, special showings, and other proceedings before the FCC are discussed in Chap. 7.

**Local Ownership.** With their greater ability to raise money, cable MSOs may often outbid local groups for a new franchise. Or the local businessmen who built and operated the cable system may wish to sell it to an MSO after a few years. Besides the financial arguments for MSO ownership in such cases, the usual claims are that the MSO brings greater management expertise to operate the system and greater resources to develop new programming and new services. For example, TelePrompTer, with more than 100 cable operations throughout the country, has developed a sizable library of television programming that is available only to its systems. A locally owned company might not have the resources to produce or purchase comparable programming. As another example, American Television & Communications is experimenting with several kinds of new cable services in Orlando, Florida. As these services are developed and proved feasible, the company may be able to offer them in its other systems more readily than could a local entrepreneur.

Still, all things being equal, communities may prefer that their cable system be locally owned. Should the community then try to favor local applicants for its franchise? Typically, a cable MSO seeking a community franchise will form a local company to submit its application. Influential local residents will be invited to buy shares in the local company—usually 10 to 20 percent—but the MSO will retain majority control. If a community wants a greater degree of local ownership, it presumably could use the fraction owned by local residents as a criterion in awarding its franchise. However, it does so at the risk of losing the benefits of scale that cable MSOs bring to an operating system.

**Minority Ownership.** A related issue in many cities is whether to favor or openly support cable ownership by blacks, Mexican-Americans, and other minorities. Many minority spokesmen see cable television as an excellent vehicle for community development. They argue that a minority-owned cable system will be

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3 It could be argued that such an ownership restriction is an illegal restraint on interstate commerce. The issue has not yet been joined before the FCC or the courts.
more likely to hire minority residents, promote other minority businesses through local programming and advertising, and reinvest profits in the community. After all, these spokesmen note, cable television is trying to get into the inner city, while most other businesses are trying to get out. Although cable’s importance for community development vis-à-vis other businesses is open to question, there is no doubt that cable ownership is an important goal in many minority communities.

As in the telephone, television broadcasting, and other communications industries, minority group members have had little to do with cable television’s past development. Only three out of more than 4500 franchised cable systems in the United States are even partly black-owned.

Gary, Indiana recently awarded a second, nonexclusive cable franchise covering the entire city to Gary Communications Group, a corporation owned by local black residents. TelePrompTer purchased the city’s first franchise from a local businessman in February 1971. Since TelePrompTer had not begun construction and had no significant local ownership, Gary Communications Group applied for a second franchise in July, 1972 and received it in September. Both companies now are negotiating over pole rights, and both have applied to the FCC for certification of their franchises.

The 20 stockholders of Gary Communications Group have invested $100,000 in initial capital and have contracted with a black-owned firm experienced in cable system construction. In general, however, the lack of management experience and access to capital have been far greater barriers to minority ownership of cable than to other forms of local ownership. As a result, some minority group organizations are exploring prospects for sharing ownership with a cable MSO—the joint venture approach.

**Joint Ventures Between Community Groups and MSOs**

The past year has seen several proposals for dividing cable ownership between a corporate cable MSO and a local corporation representing community groups. The local corporation can be either profit-seeking or noncommercial. It need not be minority controlled, of course, but some of the first examples have involved minority group organizations in the Bedford-Stuyvesant section of Brooklyn; Dayton, Ohio; and the Watts area of Los Angeles. None of these groups has as yet received a cable franchise.

From the MSO’s standpoint, an alliance with a local group may be politically the best way to obtain the community’s franchise. As mentioned before, a cable MSO

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usually establishes a local corporation with local participants to present its franchise bid. In a joint venture, the operator would have a community group as his local partner rather than a small number of well-placed (and usually well-heeled) individuals.

From the community group's standpoint, a commercial partner offers available capital and management expertise—two essential ingredients for success. However, the community group, if it wants to control the system, should have access to some capital itself before negotiating with a commercial partner. If it does not, the MSO may well end up dominating the joint venture.

As a specific example, Cypress Communications (now part of Warner Communications, presently the second largest MSO) recently proposed a joint venture with a black-controlled community group to obtain the cable franchise for the predominately black section of Dayton, Ohio. The community group—Citizens Cable Corporation—would raise $150,000 of the $2,000,000 needed to build the cable system through a sale of stock to local residents. Cypress would commit its own funds and arrange to borrow the remaining $1,850,000, as shown in Fig. 14. The resulting joint venture corporation would be owned 50 percent by each partner, although Cypress would retain majority control until its loans to the community group have been repaid. At that time, the community group would have the option of purchasing Cypress' 50-percent interest in the system at a price determined by independent appraisal.

This illustrates how a joint venture is defined. These terms are not meant as guidelines for other communities, however, since the financial contributions, responsibilities, and percentage ownership of each partner must be negotiated in each local situation. Furthermore, joint ventures have some problem areas that may lead to squabbles. For example, the community group may want majority control from the beginning, even if it contributes only a small fraction of the venture's funds. Others who are not included in the venture may think that the community group is reaping windfall profits or influencing the city unfairly. Some "public interest" groups, like some commercial applicants, have used high-pressure tactics in their efforts to obtain franchises. Finally, if the community group contains diverse elements, the commercial partner may not know who speaks for it or whom to deal with when conflicts arise.

Insofar as it represents a compromise between partners with dissimilar objectives, a joint venture may build in frustrations for each partner as well as potential rewards. Still, it may represent the most feasible path for community-based owner-
$150,000 From Public Stock Sale

CITIZENS CABLE CORPORATION $400,000 10 Yr Loan

CYPRESS COMMUNICATIONS CORPORATION

$1,000,000 Loans From 3rd parties arranged by Cypress Communications

CYPRESS CABLE OF SOUTHWEST DAYTON, INC.

$500,000 Stock Purchase

$500,000 Stock Purchase

$2,000,000 in cable system

CABLE SYSTEM SERVING SOUTHWEST DAYTON

Courtesy: Cypress Communication Corporation.

Fig. 14—An illustrative joint venture—the proposed Southwest Dayton cable system

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ship of cable in the major markets. A joint venture in a minority area also may help to develop minority entrepreneurship that in the long run can benefit the entire community.

PUBLIC OWNERSHIP

Municipally Owned Cable Systems

At last count, 18 cable television systems in the United States were municipally owned. Most of these were started in the early years of cable's development, in areas that private entrepreneurs chose not to wire. And most are very small; as shown in Table 15, only four municipally owned systems have more than 1000 subscribers.

Today, however, cities such as Palo Alto, California and Detroit, Michigan are considering owning and operating their own cable systems. The principal incentive in municipal ownership is, of course, the prospect that the city can earn a profit from cable television or pass any surplus on to subscribers in the form of lower rates. The experience of Frankfort, Kentucky is often cited as an example. The Frankfort cable system delivers 11 channels of television programming, including about one and one-half hours of locally originated programming each day, for a monthly fee of only $2.50. Installation fees were $100 when the system was first built in 1955, but

<table>
<thead>
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<th>City</th>
<th>Subscribers</th>
<th>Saturation (%)</th>
<th>Subscriber Rates ($)</th>
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<tbody>
<tr>
<td>Frankfort, Ky.</td>
<td>5700</td>
<td>71</td>
<td>5.00 2.50</td>
</tr>
<tr>
<td>San Bruno, Calif.</td>
<td>2750</td>
<td>42</td>
<td>15.00 4.75</td>
</tr>
<tr>
<td>Opp, Ala.</td>
<td>1050</td>
<td>81</td>
<td>Free 4.75</td>
</tr>
<tr>
<td>Norway, Mich.</td>
<td>1049</td>
<td>87</td>
<td>60.00 1.75</td>
</tr>
</tbody>
</table>


74
favorable operating experience has enabled the city to reduce the installation charge to $5.00. Even at these rates, the system earns a surplus, which it donates to local charities.

The Frankfort system's success is due largely to its location in typical "cable country," where off-the-air television reception is inadequate. The system maintains a 71-percent saturation level and can operate much like a public utility.

Municipal ownership may appear especially attractive to cities that own and operate electric and water utilities, with which cable shares a number of operational similarities. Utilities already have employees with many of the necessary skills for cable installation and service, and long experience in handling service calls, bookkeeping, and billing. Most important, city-owned utilities may have built up cash surpluses that can be used to finance cable system construction. The basic financing for the Frankfort system was guaranteed by the city's municipal electric and water company.

The city could also finance its system through tax assessments, general obligation bonds, or revenue bonds. The most feasible source is municipal revenue bonds, under which the bond holder can look only to the project's earned revenue for interest and principal repayment. The use of general obligation bonds or tax revenues usually would limit a city's ability to finance other worthwhile projects. And since most communities are already hard pressed for funds, it may be difficult to argue that tax dollars should be diverted from other needs to cable—particularly if private industry stands ready to use its own investment capital.

Communities should also be sure they have the legal authority to own and finance a cable system. As a relatively new service, cable television is rarely mentioned in state statutes that grant powers to local governments. For that reason, private cable operators in California questioned the city of San Bruno's authority to own a cable system, although the issue was resolved in the city's favor. In some states, municipal bonds may be sold only for specified purposes—with cable television not among them. Consequently, new state legislation may be required to include cable television as a valid municipal function.

Besides direct municipal ownership and operation of cable television, other forms of public ownership have been suggested. These include:

- Creation of a special cable authority to build and operate a system
- Lease of a publicly owned system to a private operator
- Municipal sale or purchase of a cable system
Special Cable Authority

Creation of a quasi-governmental public authority to own and operate a cable television system has been seriously considered in cities such as Dayton, Ohio and Detroit, Michigan. A recent study for the City of Detroit points out the differences between public authorities and municipal governments:

First, [public authorities] are usually created to perform a single, entrepreneurial function while municipalities have many, diverse responsibilities. Second, an authority typically must finance its capital programs through bond sales—at least initially—and must rely on charges for its services to meet operating costs and debt repayment. That is, authorities usually have no tax levying power. Third, authorities are free of budget and personnel restraints generally imposed on municipalities. And finally, authorities are relatively far removed from the normal political process and independent of the general purpose governmental entities which create them.

Moreover, a special cable authority may represent the only effective way to operate a public cable system that crosses local jurisdictional lines.

Special authorities have disadvantages as well. First, creating one for cable probably would require new enabling legislation from the state. This could involve considerable delay. Second, a new authority would add to the proliferation of local jurisdictions that already plagued many metropolitan areas. Third, and most important, the very insulation of the special authority from the local political process might make it unresponsive to public needs and desires. Many observers of local government doubt the wisdom of establishing special authorities. They can cite a number of examples in which a special authority created for one particular purpose has acquired a life (and a taxing power) of its own, largely unresponsive to the local residents whom it is intended to serve. Obviously, a community would have to take considerable care in drafting the charter for a special cable authority.

Lease of a Publicly Owned System to a Private Operator

A municipally owned cable system usually is operated as a city department or agency, like a municipal electric or water utility. Alternatively, a cable system could be operated by a private company under a management contract from the city. This would enable the city to retain any surplus the system generated. The city also could control policies of the system directly rather than through franchise provisions. For
example, it might decide which distant television signals are to be brought in or which areas of the city are to be wired first. Moreover, the city could utilize the selling and operating skills of a commercial operator rather than rely on local civil service personnel. This might be a critical factor for success, since cable television, unlike electric power and water, is not yet a household necessity. Public employees are seldom selected for their entrepreneurial talents or their ability to market a new product or service.

As a result, one might argue that a commercial cable television operator with a good track record in running its own systems could manage a publicly owned cable system better than the city itself. On the other hand, commercial operators are likely to put their best people in systems where they have strong profit incentives. Several cable operators have, in fact, publicly stated their lack of interest in working with city-owned systems. Whether operator interest might be rekindled by offers of a profitable management contract remains to be seen.

Finally, a city might adopt a totally different stratagem and own a cable system simply in order to lease it to a private operator at an attractive rate. Since municipalities can borrow money at lower interest rates than can private industry, they sometimes issue industrial development revenue bonds to finance construction of a sports arena, an industrial park, or other essentially commercial enterprise that can bring jobs and tax revenues to the community. Similarly, industrial development bonds might be issued to finance construction of a cable system for lease to a private operator, with the city receiving no share of the system’s gains or losses. This approach can best be justified where special financial inducements are needed, as perhaps to wire a low-income or low-density area. A city would have to explore relevant state legislation and federal tax regulations carefully, however, since industrial development bonds have not been used previously for cable system financing.

Municipal Sale or Purchase of a Cable System

Similar to leasing a system built with industrial development bonds, some have argued that a city would find it attractive to build its own cable system and then sell it to a private operator. If the city could finance construction with low-interest, tax-exempt bonds, it might earn a sizable profit upon the system’s sale.

Although such “profits” to the city may look tempting, this approach carries with it some major problems. First, use of the city’s municipal bond-raising ability in this way may not be legal. Regardless of its legality, it certainly raises the policy
question of whether city coffers should be swelled at the expense of general taxpayers, who subsidize the cost of lower interest rates on municipal bonds. Most critical, however, is the wisdom of beginning a long-term construction project without a commitment to operate the system. Without a firm contract for purchase of the system at the beginning (which probably would bring severe legal problems regarding the use of municipal financing), the city might find that private operators were not willing to pay what the city wanted. In short, taxpayers would bear the risk that commercial investors have borne heretofore.

Some communities have considered the opposite approach. They would grant a franchise to a private operator to build and operate a cable system, but include in the franchise the right to purchase the system for the city's own operation at a later date. In principle, this would recognize that private enterprise can best handle the aggressive marketing and tough-minded operating practices that may be needed to build a successful cable system. The city, when it took over, would have the benefit of a saturated system operating more like a utility. However, this approach usually founders on the issue of a fair purchase price for the system after it has become a going concern. A private operator naturally does not want to bear the inherent early risk without the promise of a high return when the system is sold. The purchase price he would find acceptable—usually several times his initial investment cost—may be unacceptable to municipal officials.

NONCOMMERCIAL OWNERSHIP

The third major alternative is ownership by a noncommercial group. Few non-commercial cable systems currently exist; among them, the best example is the college-owned system in Vincennes, Indiana, which serves 2400 subscribers. As with local private ownership, the chief barrier to noncommercial system ownership is lack of money and of management capability. Consequently, a joint venture between a noncommercial group and a private corporation may be the most realistic approach in most cases. Still, full noncommercial ownership has been advocated by the Sloan Commission on Cable Communications, The Ford Foundation, the United Church of Christ, and a number of local study groups.

A noncommercial cable system is likely to be owned in one of three ways:
• by a nonprofit institution
• by a local nonprofit consortium
• as a subscriber cooperative

Ownership by a Nonprofit Institution

The simplest path to noncommercial ownership is for a financially strong, nonprofit institution to obtain a franchise—for example, a local university that is already involved in instructional television. An existing institution would have some experience in administering large projects, and may have access to financial backing. On the other hand, it may not represent all elements in the community. Minority groups and the poor, in particular, are unlikely to assume that their interests will be well served merely because the franchise holder is a nonprofit instead of a commercial organization.

Ownership by a Local Nonprofit Consortium

A noncommercial corporation formed expressly to own a cable system might ensure more widespread community representation. The new corporation could be a consortium of other nonprofit groups, as The Ford Foundation recommended in its 1970 FCC filing:

Obvious candidates for participation in such a consortium, in addition to public television stations, include universities, libraries, service organizations, community action agencies, neighborhood associations, PTAs, school systems, chambers of commerce, professional associations, nonprofit organizations primarily interested in television (such as Children’s Television Workshop) and foundations.

The Office of Communication of the United Church of Christ is spearheading an effort in Connecticut to gain cable franchises for noncommercial community groups.

Raising capital to build a system will be harder for a community consortium than for an established institution, public or private. Although a number of creative financing approaches have been proposed—including “seed capital” loans, loan guarantees, subsidized interest payments, and tax-oriented partnerships—each usually requires a sizable capital commitment at a lower than marketplace return. Foundation grants might be available where there is strong leadership for a community-
based system, but foundations are naturally reluctant to make more than a very few such commitments. Federally sponsored organizations, such as the Opportunity Funding Corporation, may be able to help local Community Development Corporations. However, no direct federal support for noncommercial cable ownership is available today. Community groups should therefore recognize that obtaining a financial commitment for cable system ownership is likely to be difficult.

Moreover, issues of participation, responsibility, and authority become harder to resolve as more diverse community elements are added. It is naive to assume that community groups will work together easily, merely because they are not profit-oriented. A noncommercial consortium will be faced with such knotty questions as:

- On what basis will nonprofit groups or individuals participate in the consortium? Could anyone be excluded?
- How will conflicts be resolved and policy decisions made?
- Who will take day-to-day responsibility for building and operating the cable system?

Present-day community consortia such as United Funds and Model Cities agencies usually do not manage large projects themselves—for good reason. They are not designed to be effective operating entities. Consequently, a noncommercial consortium that received a franchise might well contract with a private, profit-seeking corporation to operate the cable system, retaining for itself the ownership and policymaking functions. Or it might first negotiate with a private operator to share ownership of the system in a joint venture.

**Subscribers’ Cooperative**

Finally, subscribers themselves could own the system. Some of the earliest cable systems were built by people in remote areas who pooled their capital. Today about thirty cable systems—all of them small—are operated as subscriber cooperatives. In principle, a larger community could use the same approach. An investment of perhaps $100 per subscriber would be needed (the rest could be debt-financed), and a commercial company could operate the system under a management contract.

The advantages of direct ownership by the system’s users seem outweighed by the disadvantages. For one thing, this approach discriminates against the poor. For another, the system would be cumbersome on a large scale. It might prove to be no more responsive to its shareholders than are mutual insurance companies and
savings banks; and the same difficult issues of participation, responsibility, and authority that beset nonprofit consortia would have to be resolved.

COMPARING OWNERSHIP ALTERNATIVES

Every community should consider alternatives to private ownership before franchising its system. In doing so, however, three additional caveats are in order:

- The system may not be profitable
- Most policy issues are independent of ownership
- Control of channel access may be more important than ownership

Uncertainty of Profits

We cannot emphasize too strongly that big-city cable systems may not be profitable for many years, if ever. No one really knows for sure. If a municipal system is not profitable, the city must either sell out at a loss or use tax money to make up the deficits. Taxpayers will take a beating in either case.

Noncommercial ownership does not involve a comparable risk to taxpayers, but prospective backers of noncommercial cable ventures in the major markets should be equally aware of both risks and potential gains.

Policy Issues Independent of Ownership Form

Most of the same questions regarding rates, services, and other policies will arise whether the owner is a large corporation, a noncommercial group, or the municipal government. A sampling of these issues, some of which are discussed more fully in Chap. 6, includes:

- Which neighborhoods should be wired first?
- On what basis will subscriber rates be set?
- Should some users subsidize others (as would be the case, for example, with preferential rates for the elderly)?
- What balance will be drawn among system capacity, quality, and cost?
• Should the system charge more for conventional television distribution to compensate for introducing new service at a loss?
• How much will local programming be emphasized?

Taking the last issue as an example, some may argue that a noncommercial owner will emphasize local programming more than a private operator, or otherwise act in a more "enlightened" manner. Others would argue that a commercial operator has more incentive to increase his subscriber base and therefore will offer local programming of greater interest to the community.

Most policy choices are independent of the form of cable ownership. A community that feels strongly about, say, the need for several origination studios in different neighborhoods might achieve its goal best by writing franchise provisions that will apply to any public, private, or noncommercial system owner.

Ownership Versus Access

Many of the past arguments for public or noncommercial ownership have really been arguments against private control of cable channel use. Under present FCC rules, described briefly in Chap. 5, the cable operator in a major market does administer two special channels for education and public access. But the rules for access must be stated publicly and approved by the FCC. Moreover, while the cable operator can use channels for commercial local programming and other business purposes, he must lease any unused channels on a first-come, first-served basis. Thus, no matter who owns the system, channel time must be available for any group that can afford to lease it.

Nevertheless, the ownership-versus-access issue is very much alive, particularly among minority groups. Most cable industry representatives, and many government officials, urge minority groups to concentrate on access rather than ownership. Without capital, they argue, blacks and other minority group members can best use their economic and political leverage to produce programming and develop new cable uses. Minority group spokesmen counter with the argument that ownership determines access. No matter what federal regulations and local franchise terms are written, they contend, the cable owner will call the tune on important policy decisions. Without local (in this case, minority) ownership, they believe cable will be simply one more industry controlled by absentee owners far beyond the
community's reach. In the words of one black spokeswoman: "Without any control over the system, we may only be able to cry out 'Help' on CATV channel 38."4

Although outsiders may question the importance of ownership as opposed to access, ownership is a vital, emotionally charged issue to those who fear they will be left out. For this, if for no other reason, serious consideration should be given to alternative forms of cable ownership.

ENCOURAGING OWNERSHIP DIVERSITY

Today the arguments for and against public and noncommercial ownership are largely academic, and will remain so as long as cable systems remain almost entirely in private hands. From the national standpoint, it would therefore be important to have some large public or noncommercial cable systems built and operated. Whether these systems succeeded or failed, they would serve as useful yardsticks to measure the performance of private cable operations.

This point has been made before, by the Ford Foundation, by the Sloan Commission on Cable Communications, and in other Rand reports. For example, the Sloan Commission report states:

The public interest, certainly in this period of growth and experiment, would be best served if cable systems are owned, and cable channels managed, by a wide range of interests, including nonprofit community groups and organizations representing minorities within the larger public.... We recommend that local communities affirmatively seek to ensure diversity in ownership and management....

What appears important on a national scale, however, may not be particularly helpful to local decisionmakers. A community, after all, must live with the results of its decisions—good or bad—for many years. Consequently, while each community should consider public and noncommercial ownership, it must ask itself several hard questions:

- Who will take final responsibility for system operations?
- Where will the money come from to build the system?

• Is the city or nonprofit group prepared to wait through several years of losses in anticipation of eventual surpluses?
• What would happen if the system failed?

Operating a successful public or noncommercial cable system demands a much greater community commitment than does franchising a private operator. Quite probably, most communities will not choose to devote substantial financial and leadership resources to public or noncommercial cable ownership. But if some communities make the commitment, the next few years will see a greater diversity in cable ownership than has been the pattern of the past.

SUMMARY CHECKLIST

• Has the community considered the advantages and disadvantages of commercial, noncommercial, and public system ownership?

• Has the ownership pattern of nearby cable systems been explored?

• If the community franchises its cable system to a commercial operator, will local ownership (perhaps including ownership by minority group individuals) be a factor in selecting the franchisee?

• Has the franchising authority required each applicant to list its local partners, their ownership shares, and any other consideration given to local residents?

• Has the possibility of a joint venture between a local group and a commercial cable operator been explored?

• Have potential problems of local media cross-ownership been evaluated?

• Would the city have legal authority to raise money for and own a municipal cable system?

• Has the community considered creating a special public authority, perhaps covering more than one local jurisdiction, as an alternative to municipal ownership?
• Does the community possess the local leadership and financial resources for noncommercial cable ownership?

• If either public or noncommercial ownership is under serious consideration, can the following questions be answered satisfactorily:
  — Where will the money come from to build the system?
  — Who will take final responsibility for system operations?
  — Is the city or nonprofit group prepared to wait through several years of losses in anticipation of eventual surpluses?
  — What would happen if the system failed?
Chapter 5

PLANNING FOR A CABLE SYSTEM

THE DECISIONMAKING PROCESS

Local decisionmaking for cable television is a continuous process, moving from planning through drafting the franchise, selecting the franchisee, regulating the system, and managing public services on cable (Fig. 15). Every phase should include interaction among local officials, community groups, commercial organizations, and individual citizens.

This chapter focuses on planning for a cable system; Chaps. 6 and 7 deal with drafting the franchise and regulating the system after a franchise is awarded. The discussion in this summary Handbook must necessarily be brief. Readers will want to consult several companion reports for more detailed treatments of these issues.

1 Leland L. Johnson and Michael Botein, Cable Television: The Process of Franchising, The Rand Corporation, R-1135-NSF.
   Carl Pilnick, Cable Television: Technical Considerations in Franchising Major Market Systems, The Rand Corporation, R-1136-NSF.
   Monroe E. Price and Michael Botein, Cable Television: Citizen Participation After the Franchise, The Rand Corporation, R-1158-NSF.
   Robert K. Yin, Cable Television: Citizen Participation in Planning, The Rand Corporation, R-1137-NSF.
Communities should recognize at the outset that decisions about cable television are part of the local political process. A cable television franchise usually is adopted in the form of a local ordinance by the city council or other local government body that has franchising authority. Although the FCC has set down many rules and guidelines, each community must decide what sort of franchise it wants, write the franchise, and award it. Watchful citizens will view these decisions as distributions (or redistributions) of economic and political power.

Consequently, it is to be expected that as issues of cable ownership, access, and services arise for open public discussion, heated debate will ensue among different community elements. Groups may find that they have strong and honest differences, and that arriving at compromises is difficult. Some, for example, may favor extensive community origination programming, even if it means higher rates for subscribers. Others may take precisely the opposite view. Resolving such differences is a part of local politics, as much so as electing a mayor or city council. No cable handbook, independent study, or consultant's advice can or should substitute for local political decisionmaking.

Possible abuse of the political process also should be faced squarely. In dealing with the issues of money and political power that surround cable, some people may claim to represent the "public interest" while serving their own private interests. This can be as true for those representing noncommercial groups as for businessmen or public officials. A community group leader or local official could conceivably enter into a private agreement from which he might reap substantial gain if the franchise were awarded to a particular applicant. Cable television certainly is no worse in this regard than other industries that have sometimes figured in the news, such as taxi service, roadbuilding, construction, and rubbish disposal; its record probably is bet-
ter. But, unfortunately, some well-publicized bribery incidents have occurred in recent years. These abuses are partly responsible for state and federal efforts to preempt local regulation of cable television. Citizens should be alert to these problems—and local officials should recognize that with growing community interest in cable television, their actions will be subject to a great deal of public scrutiny.

THE REGULATORY FRAMEWORK

Local authority to franchise and regulate cable television derives from the cable system's need for access to city streets and other rights-of-way. Yet local planning and franchising must take place within the framework of federal and state laws and regulations. Chief among these is the recent Cable Television Report and Order, adopted by the FCC on February 2, 1972, which contains rules and guidelines that strongly affect the choices open to local franchising authorities.

The 1972 Cable Television Report and Order

The 1972 FCC rules emerged as a compromise among cable, broadcast, and program copyright interests. Perhaps as a result, the rules are complex, difficult to read, and often ambiguous. Moreover, areas of serious contention still exist that will require further Commission or court review. Recently appointed advisory committees to the FCC will recommend changes to the rules. Some city officials appear ready to challenge them in court if certain interpretations are not modified. And the FCC itself is continuously reconsidering the rules as it acts to certify local franchises.

Thus, the federal rules for cable are still evolving. The companion reports to this Handbook are intended to help community groups and local officials deal with their present intricacies. This section merely summarizes (with some danger of oversimplification) the principal rules applicable to local franchise decisionmaking.

Cable System Location. Different rules apply to cable systems located in major metropolitan areas—the 100 largest television markets—and in smaller communities. A community is considered to be in one of the top 100 markets if it is within 35 miles of a central reference point listed by the FCC for each market.

Cable Carriage of Broadcast Television Signals. Cable systems must carry all local broadcast television stations, including educational stations, television "translators" (i.e., relay stations), and stations beyond 35 miles that are "signifi-
cantly viewed" in the community. In addition, cable systems may bring in signals from other cities up to certain limits, as shown in Table 16. Generally, major market systems will be able to import two or three commercial stations. They also can carry additional educational and foreign language stations.

Understandably, most cable operators would like to import the popular "independent" television stations from large cities such as New York and Los Angeles, in order to boost cable subscriptions. Two additional restrictions, however, limit their range of choice. First, if a major market cable system wants distant signals from any of the top 25 markets, it must select them from one of the nearest two (with certain exceptions). This is known as the "leapfrogging" restriction. Second, and more important, a cable system cannot import any program that a local broadcaster has the exclusive right to show. Such exclusivity rights are common for feature films, syndicated series, and other program packages sold to broadcasters. The effect of this restriction, according to a recent study, may be to "black out" more than half the programs that otherwise could be brought into cable systems in some of the top 50 markets. The exclusivity restriction is less important in smaller markets, because they have fewer local broadcasters.

**Cable System Requirements.** The FCC rules require that all cable systems in the top 100 markets have:

- A 20-channel minimum capacity, or at least one channel available for nonbroadcast use for each channel carrying broadcast signals. That is, a cable system carrying 14 broadcast signals must have 14 other channels available for other uses.
- Some two-way capacity (although two-way services need not be provided as yet).
- Three channels reserved for local uses, known as "access channels": one each for education, local government, and public access. The education and government channels must be made available free of charge for at least five years. The free public access channel must be reserved indefinitely.
- Local programming "to a significant extent" if the system has 3500 or more subscribers.

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1 These terms are defined in the *Cable Television Report and Order.*

2 A more complex rule applies to major market systems that can import a third signal: they must choose a UHF station within 200 miles, or if one is not available, then either a VHF station within 200 miles or any UHF station.

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<tr>
<th>FCC Priorities</th>
<th>Markets 1-50</th>
<th>Markets 51-100</th>
<th>Smaller Markets</th>
<th>Communities Outside All Television Markets</th>
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<td>1 Cable systems must carry these local signals upon request of the station licensees</td>
<td>All stations within 35 miles&lt;sup&gt;a&lt;/sup&gt;</td>
<td>All stations within 35 miles&lt;sup&gt;a&lt;/sup&gt;</td>
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<td>All translator stations&lt;sup&gt;b&lt;/sup&gt; in the community with 100 watts or higher power</td>
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<td>2 Cable systems may bring in signals to provide a &quot;minimum service&quot; (including local signals)</td>
<td>3 network stations&lt;sup&gt;b&lt;/sup&gt;</td>
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<td>3 Additionally, cable systems may bring in these other signals</td>
<td>2 independent stations&lt;sup&gt;b&lt;/sup&gt; if they have not been counted under &quot;minimum service&quot; quota above</td>
<td>2 independent stations&lt;sup&gt;b&lt;/sup&gt; if they have not been counted under &quot;minimum service&quot; quota above</td>
<td>Any number of educational and non-English language stations&lt;sup&gt;b&lt;/sup&gt;</td>
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<sup>a</sup>See the FCC Cable Television Report and Order of February 7, 1971, for definition of these terms and additional details that may affect some communities (e.g., overlapping signals).

<sup>b</sup>Subject to leapfrogging and exclusivity restrictions as defined in the Cable Television Report and Order.
• Unused capacity available on a leased basis. Additional channels for lease must be added when demand warrants.
• Minimal technical performance standards for broadcast channels.

In effect, the rules preempt a local franchise authority from setting more demanding capacity requirements than those unless it can justify them to the FCC. This can be done by means of a "special showing," as outlined in Chapter 7. However, a city may impose more stringent technical standards without a special showing if it is prepared to enforce them itself. Communities outside the major markets can stipulate these requirements in their franchises, although the FCC rules do not demand that they do so.

**Procedures and Limitations on Franchising.** The rules require local franchise authorities to follow certain standards if their franchises are to obtain an FCC "certificate of compliance"—without which the cable system cannot carry any broadcast signals. In granting a franchise, the local authority must consider the "legal, character, financial, technical, and other qualifications" of applicants by means of a "full public proceeding affording due process." In addition, the rules stipulate that:

• The franchising authority must approve rates charged subscribers.
• The initial franchise duration may not be more than 15 years.
• The franchise must contain provisions for handling subscriber complaints.
• The franchise may not prohibit pay television.
• The cable system must begin construction within a year after the FCC has issued its certificate of compliance and must wire a "substantial percentage of its franchise area each year" (20 percent is suggested) in an "equitable and reasonable" manner.
• Franchise fees cannot exceed 3 percent of subscriber revenues without specific approval by the FCC.

**Grandfathering.** A cable system in operation and serving 50 or more subscribers prior to March 31, 1972, generally has five years from that date to comply with the new rules regarding system requirements and franchising. This is known as "grandfathering." However, a system's grandfather rights expire at the end of its current franchise if this occurs before March 31, 1977.

In summary, the 1972 FCC rules permit major market cable systems to import some television signals from other cities in return for increasing system capacity
and dedicating some channels to nonbroadcast use. They also limit the local franchising authority's power to impose on cable operators' high franchise fees, additional capital investment requirements, or demands for free services. Finally, they introduce some uniform procedures and a modicum of public participation into the franchising process.

State Regulation of Cable

Several states have also entered the regulatory picture. Connecticut, for example, has taken cable television franchising completely out of the hands of local authorities. The Connecticut Public Utilities Commission creates franchise districts crossing local jurisdictional lines, grants awards, and administers the franchises. Hawaii, Nevada, Rhode Island, and Vermont also have enacted legislation giving the state public utilities commission regulatory authority over cable television. On the other hand, the Utah Supreme Court recently ruled that cable should not be regulated as a public utility in that state.

Massachusetts has established a Community Antenna Television Commission; without itself holding the power to franchise, the Commission can issue standards and regulations that local franchising authorities must follow. New York also has adopted legislation creating a state Commission on Cable Television, and other states such as Illinois, Iowa, and California are exploring this route.

This Handbook does not discuss the pros and cons of state regulation of cable and the various regulatory standards established by states. Communities should be aware of the trend toward state regulation, however, and should follow developments in their states closely.

NEGOTIATED OR COMPETITIVE FRANCHISE AWARDS?

Two basic approaches, negotiation and competition, have been used in cable planning and franchising. Under the first, the city selects a prospective cable operator and negotiates the many terms and conditions that will go into the franchise. Often, the city bargains informally with several potential operators before entering

\footnote{A good case for state regulation can be found in Stephen R. Barnett, "State, Federal and Local Regulation of Cable Television," *Notre Dame Lawyer*, April 1972, pp. 685-694.}
into serious negotiations with one. If the negotiations break down, the city may turn to another prospective grantee.

The negotiation approach has the advantage of flexibility. The franchising authority and the prospective grantee can bargain back and forth until they agree on a mutually attractive overall package. A good working relationship that can benefit the entire community may well emerge from this give-and-take. Negotiation also expedites the planning and franchising process since it involves relatively few participants. Its major disadvantages are: (a) early selection of an operator can arouse complaints by other prospective candidates who feel unfairly shut out, (b) it does not permit the degree of community participation that citizen groups often demand, and (c) however scrupulously the negotiations are conducted, the participants are vulnerable to suspicion by outsiders that under-the-table dealings are going on.

In contrast, “the competitive bid and award” approach involves a longer and more formal procedure in which the franchise authority must detail the terms and conditions of the franchise in advance. The authority then invites bids from all interested parties and makes the award according to preestablished criteria.

This approach seeks to avoid any real or alleged favoritism toward a particular prospective grantee, and usually provides more opportunities for citizen participation throughout the process. Its disadvantages lie in being potentially (a) more time-consuming, (b) more costly in terms of both staff and consulting time required by the franchising authority, as well as additional burdens placed on franchise candidates, and (c) less flexible insofar as the franchising authority has greater difficulty in modifying its earlier decisions about terms and conditions once its Request for Proposals is issued.

Neither approach is clearly preferable to the other for all communities. Moreover, a combination of open competition and negotiation may be preferred. For instance, a franchising authority could first request competitive bids and then negotiate with the top applicant or applicants. This Handbook describes the competitive bid approach more fully, so that communities can be familiar with the steps it may entail. Not all of them are mandatory, however. In cases where franchising authorities prefer stronger elements of negotiation, some of the steps in the competitive process could be eliminated or compressed in time and scope. These steps include:

1. Adoption of procedures for planning and franchising.
2. Assessment of community needs, objectives, and alternatives.
3. Public hearings and tentative decisions on major issues such as ownership.
franchise district boundaries, and interconnection.
4. Hearings on and adoption of a draft franchise document describing the
general terms and conditions of the final franchise.
5. Preparation and dissemination of a Request for Proposals from franchise
applicants, based on the draft franchise document.
6. Hearing on proposals received from applicants for the franchise.
7. Decision on award of franchise.
10. Continuing administration of the franchise.

The planning phase includes the first three steps, as shown in Fig. 16.

![Diagram of planning process]

Fig. 16—The planning process

**STEP 1: ADOPTION OF PROCEDURES FOR PLANNING AND FRANCHISING**

How to Begin

In an ideal situation, planning for cable television will begin as a prudent
anticipation of the future, not as a reaction to sudden political pressures for granting
a franchise. Few communities enjoy that luxury today, however. All too often, the
first step in the planning process is launched by the announcement that a commer-
cial company has approached the city council about the community's cable television franchise. The council may then form a special cable television committee to consider franchise applications. In unincorporated areas the county government generally will have franchising authority.

At this point the franchising authority should delegate responsibilities and formulate the procedures to be used in the overall planning and franchising process. Here it would address such questions as whether procedures will be adopted by "gentlemen's agreement" or by local ordinance, and what state guidelines, if any, apply. An area-wide moratorium on franchising might be suggested while several communities study the issues of franchising. The authority would also consider how to encourage community participation by having formal, well-publicized hearings at critical stages in the decisionmaking process. With only a general FCC requirement of a "public proceeding affording due process," the real responsibility for formulating a franchising procedure remains in the hands of state and local authorities.

**Involving the Total Community**

Formal public hearings are only one form of citizen participation. Individuals and groups eager to take part in the decisionmaking process are likely to make themselves known at an early stage. The franchising authority may recognize this as an opportunity to start off on the right foot by involving community representatives in setting the procedures themselves. Community involvement at this first step can create a favorable climate for constructive participation throughout the planning and franchising process.

The franchising authority should consider establishing community panels to advise it on such issues as cable system design, system ownership, rules for public access, and use of the education and municipal channels. These panels would include representatives from all elements of the community, particularly from minority and low-income groups, who may stand to benefit the most from public services on cable. Special efforts may be necessary to gain their active participation, since minority residents and the poor may look skeptically on cable television as merely the newest scheme for exploitation by corporations and institutions they are powerless to control.

The authority will also want to consider its need for outside advice or independent studies. It may want to commission a survey of community needs for and interests in cable services, perhaps in conjunction with a local university. It may want to hire one or more consultants to work with the city (and with community groups)
during the planning phase. Or, if funds are available, it may want to commission a full-scale study of cable like the ones done for such cities as Dayton, Ohio and Jacksonville, Florida.

**Time and Cost**

Outlining these steps may make local officials and others wince at the time and potential cost of the decisionmaking process. Indeed, few communities will have the resources to commission a full-scale study that for a major city might cost $50,000 to $100,000 or more. Fortunately, much can be learned from previous studies listed in the Handbook references. Many citizens may also volunteer their time, so that paid professionals can be used only on a selective basis.

It is true that the more citizens who participate in cable planning and franchising, the longer the process is likely to take. Yet citizen participation is not only important in assuring that a cable system serves community needs, but is necessary as a matter of sheer political reality. Today’s citizen groups—particularly minority groups—demand that their voices be heard.

Despite the risks, a long drawn-out franchising process seems clearly preferable to an overly short one that is firmly “managed” by the franchising authority. Consequently, although no precise timetable for planning and franchising can be drawn, communities certainly should allow for at least six months—and perhaps for a year or more if major studies are to be conducted—between the first official actions and the time of the franchise award.

**STEP 2: ASSESSMENT OF COMMUNITY NEEDS, OBJECTIVES, AND ALTERNATIVES**

During step 2 the community would:

- Send for and review published information about cable;
- Review the experience of other communities;
- Conduct community surveys;
- Consider the size and characteristics of franchise districts, including possibilities of coordinated franchising with nearby jurisdictions;
• Investigate uses of the public access, education, and local government channels;
• Study ownership alternatives, system design concepts, economic implications, and other issues.

Some would call this the study phase. It can be as limited or extensive as the community wants and can afford.

Review of Published Information

A vast amount of published information about cable is now available—so much, in fact, that we seem more bent on papering the cities than wiring them. Guides to the literature, such as those listed in the Handbook references, can be helpful.

Review of the Experience of Other Communities

Direct conversations with local officials and others involved with franchising in other communities also will prove useful. Although individual word-of-mouth contact is the most tried and true approach, the FCC Cable Television Bureau and organizations such as the Cable Television Information Center of the Urban Institute, the National League of Cities, the International City Management Association, and state cable television associations can help locate knowledgeable people. These organizations, some universities, professional societies, and research institutions such as the Stanford Research Institute, the MITRE Corporation, and The Rand Corporation also have held conferences to enable municipal officials and others to exchange views on cable issues.

Staff members from the FCC Cable Television Bureau and the Cable Television Information Center may come to the community on request and talk with the franchising authority about specific local problems. This can be a valuable service; franchising authorities would be well advised to confine their requests to this purpose, rather than ask for introductory briefings on the general subject of cable television.

Conduct of Community Surveys

Surveys can provide helpful information for planning a cable system, such as data on television viewing habits, programming of special interest to particular
groups, and the likely appeal of basic cable television service to the community. Surveys may also measure the potential appeal of new programs and services—whether more people would pay to see a local basketball game than to see the Metropolitan Opera, for example—though such preferences should not be construed as hard market data. Finally, surveys can indicate the present pattern of communications among residents, both within their neighborhoods and with people in other parts of the city. This information can provide some guidelines for the physical layout of cable trunk lines and for determining interconnection requirements among cable districts.

Surveys also give the ordinary citizen some voice in the planning process, albeit a passive one. If not properly designed and conducted, however, surveys will be of little value and may even yield incorrect results. Communities therefore should seek professional advice before beginning a survey project.

Consideration of the Size and Characteristics of Franchise Districts

One of the first substantive issues for study is the geographic division of franchise districts. A large city may want to carve out several franchise districts with different operators rather than grant a single franchise. Or a small community might coordinate franchising with its neighbors, or seek to include unincorporated areas within its scope.

The issue is closely allied to that of system ownership and control, since the smaller the cable district and the more closely it follows neighborhood or ethnic boundaries, the easier it is for a particular group to gain a significant ownership share. Minority groups, for example, may fear that their interests will be subsumed in a large system. On the other hand, the community may want a socioeconomic balance among franchise districts, or it may seek the advantages of unified management in a single franchise. The issue involves the community’s overall size and diversity, alternative technical system designs and costs, services the system is to deliver, and, of course, a healthy dose of local politics. It is likely to stir up considerable controversy.

In addition, the community should consider cooperating with neighboring jurisdictions to achieve area-wide coverage for cable services that require simultaneous exposure to large audiences. In particular, some of the new services envisioned, such as instruction in the home, catalog shopping, and information storage and retrieval, will require computers, other sophisticated equipment, and high-quality (but high-
cost programming. These services will be feasible only if a large geographic area can be served from a central point. Cooperation among franchising authorities will be necessary to permit a single system to serve more than one jurisdiction, or to permit separate systems to interconnect and provide large area coverage for some programming while continuing to serve their own local districts.

Investigation of Uses of the Public Access, Education, and Local Government Channels

In major market cable systems, local government and community groups will be directly involved in using the three access channels mandated by the FCC. Much of the planning effort should therefore focus on these uses. Two subsequent chapters of this Handbook deal with public access and public services on cable in more detail.

Community groups and interested citizens can be especially helpful in assessing the community's need for various services. A variety of devices—including surveys, neighborhood meetings, thorough studies, and committee reports—can contribute to the planning process. Videotaping individuals and groups who might utilize time on an access channel may be a particularly valuable technique. Local theater productions, neighborhood council meetings, and programming prepared by high school groups or senior citizens can be shown at public hearings or to the franchising authority. Such tapes can present an effective case for emphasizing public access in the franchise. They may also demonstrate that the community contains far more talent than its citizens may have thought.

The franchising authority should consider delegating panels of community leaders, teachers and school administrators, and other citizens to come up with ideas and workable plans for use of the public access and education channels. It may also want to begin planning how the police, fire, social service, and other city agencies will use the local government channel. The plans developed for the use and administration of the access channels could then be discussed at the public hearings in step 3.

Some municipal officials are investigating whether a wholly separate cable system for educational, municipal, and other institutional services could be economically feasible and socially desirable. They argue that such a system would not have to conform to federal regulations so long as it did not carry broadcast television signals. As a result, the city could charge a higher franchise fee, demand more access facilities, and otherwise go beyond the limits of the FCC rules. However, it is not at
all clear if this kind of separate system for nonentertainment services would really be immune from federal or state jurisdiction. Its economic prospects also would seem questionable today, since present cable operations are based on revenues from broadcast television distribution.

Study of Ownership Alternatives, System Design Concepts, Fee Structures, Economic Implications, and other Issues

A wide range of issues can usefully be brought out and analyzed by community groups and local government officials during the study phase. They can explore basic system design concepts, including the number and location of head ends, trunk lines, and studios. An economic analysis of cable feasibility in the community might be made as described in Chapter 3. Individual experts and outside study teams can be brought in as needed. Again, the objective should be to outline alternatives and set community priorities that can be reflected in franchise provisions.

STEP 3: PUBLIC HEARINGS AND TENTATIVE DECISIONS ON MAJOR ISSUES

Step 2, the study phase, can lead directly to public hearings and tentative decisions on major issues. This should not be a strictly linear progression from formal study to formal decision, but rather an iterative process in which citizens can influence the course of ongoing studies.

Two of the first issues that confront the franchising authority in step 3 are the geographic coverage of franchise districts and consideration of municipal ownership. If the authority plans to subdivide its area of jurisdiction, it should establish at least rough district boundaries before drafting other franchise provisions. This will enable potential applicants to assess the market, the capital investment needed, and other factors important for their bids. Interconnection requirements and possibilities for joint franchising with other jurisdictions also should be considered at this time.

The question of system ownership deserves early consideration as well. This is not only because ownership is a basic issue commanding widespread community interest, but also because municipal ownership differs fundamentally from other
options. The community should tentatively decide early-on whether to pursue municipal ownership or accept bids from commercial and nonprofit applicants. Of course, this decision can be reevaluated later in light of subsequent information or events.

Since the FCC's requirement for a "public proceeding affording due process" would not require a hearing at this step, the local franchising authority must create an appropriate procedure. It will need to consider carefully how citizen input can contribute most constructively to its decisions. This will include procedures for:

- Giving public notice of hearings;
- Scheduling and organizing hearings;
- Giving notice of decisions made by the franchising authority.

Procedures for Giving Public Notice

Citizens in the franchise area must be effectively notified of impending public hearings. The usual legal notice in tiny print on a back page of the local newspaper will hardly suffice. It would be better to print a bold and readable notice on the television page of all local newspapers. Spot advertisements on all local television stations would be even more effective. Other alternatives are to post notices in public places or to mail notices to registered voters. Whatever form of notice is used, it should be given sufficiently in advance of any hearing to enable citizens to prepare intelligent and useful comments. A thirty-day notice is generally considered adequate.

Scheduling Public Hearings

After notice has been given, the franchising authority should hold hearings that encourage meaningful citizen participation. The hearings might be held in the evenings and on weekends in order to allow participation by working people. Moreover, they might each be held in different neighborhoods of the franchise area. An insufficiently publicized hearing, or one held in too small a room, is obviously not a "public proceeding." Accordingly, the procedural framework could specify that all hearings be held at locations with seating capacity for a given number of persons and with facilities for accommodating the electronic and print media.

The hearings should enable participation by all interested parties. The problem here—as with any type of hearing—is to insure that all voices are heard, but not
to the point of unproductive repetition and wearisome tedium. One approach is to impose a time limit (e.g., five minutes) on each participant. The drawback of a time limit, however, is possible unfairness to groups that represent large numbers of citizens. Alternatively; all parties could receive a minimum amount of time, subject to increases based on the number of signatures they could solicit on a petition, e.g., an extra five minutes for every hundred signatures. Rebuttal time also would be necessary to insure the ventilation of all views; it could be set, however, simply as a percentage of the initial presentation time to which a party was entitled.

Notice and Explanation of Decisions

The franchising authority should be required to publish a written explanation of its decisions within a reasonable period—perhaps thirty days—from the time they are rendered. Though experience under other procedural frameworks has shown that the requirement of explaining a decision does not guarantee better-reasoned decisionmaking, it at least gives interested parties positions they can argue for or against. Too often in the past major franchise decisions have been made without public knowledge or scrutiny.

SUMMARY CHECKLIST

- Has the responsibility for franchising been established within the city council or other local franchising authority?

- Has the franchising authority considered the effect of the FCC rules in regard to
  - broadcast signals the cable system may carry?
  - minimum channel capacity, access channels, and other system requirements?
  - local cablecasting?
  - franchising procedures?

- Have state laws or regulations regarding franchising been taken into account?
• In selecting a cable operator, what combination of "negotiation" and "competitive bid and award" approaches will be used?

• Has the franchising authority adopted a detailed set of procedures for planning the system, drafting the franchise, and making the franchise award? Have a time schedule and budget been worked out?

• Do these procedures include opportunities for citizen participation at all major decision points, through public hearings and less formal means?

• In planning for a cable system, has the franchising authority considered
  — the available literature about cable?
  — the experience of similar communities?
  — conducting a community survey?
  — delegating community study committees?
  — hiring consultants or commissioning expert studies?

• What has been done to involve all elements of the community in the planning process?

• Have the size and desired characteristics of cable franchise districts been studied, as well as interconnection requirements?

• Has the possibility of joint or coordinated franchising with neighboring jurisdictions been considered?

• Have various system design concepts been explored?

• Has an economic feasibility study been made?

• Have the administration and use of the education, local government, and public access channels been investigated?

• Have public hearings on major franchise issues been conducted with
  — adequate public notice?
  — reasonable choice of time and location to encourage citizen participation?
  — a published explanation of decisions?
Chapter 6
FRANCHISING THE SYSTEM

After making the tentative decisions regarding cable district boundaries and other major issues, the local authority can turn to the process of franchising. Results from the planning steps described in the preceding chapter will feed directly into this process. By this time, too, lively community interest and active citizen participation probably will have arisen.

Specific steps in the franchising process are diagrammed in Fig. 17. As discussed previously, these steps describe a competitive bid and award rather than a negotiated approach.

Fig. 17—The franchising process
STEP 4: HEARINGS ON AND ADOPTION OF A DRAFT FRANCHISE DOCUMENT

In cooperation with community and citizen groups, the franchising authority decides the terms and conditions under which any franchise is to be granted. Outside legal and technical assistance may be required in drafting the franchise document. Some items must be left open since they will be the basis for competition among prospective grantees. At the same time, the draft franchise should indicate the upper and lower bounds that will be acceptable—for example, a minimum monthly subscriber service rate of $6 or a requirement to build a dual cable system. The major terms and conditions that should be considered in the franchise are listed later in this chapter.

Public hearings are important at this step also, even though the FCC does not require them. Cable operators should be encouraged to air their views at these hearings, so that the franchising authority will hear what commercial interests think is practical as well as what community groups think is desirable. As in step 3, adequate notice should be given and the hearings scheduled to allow participation by all interested parties.

STEP 5: PREPARATION AND DISSEMINATION OF A REQUEST FOR PROPOSALS BASED ON THE TENTATIVE FRANCHISE DOCUMENT

After drafting the tentative franchise document, the franchising authority prepares a formal request for proposals (RFP). This includes the proposed terms of the final franchise and a request for proposals from applicants concerning provisions left open. The RFP should distinguish clearly between negotiable franchise items and those on which it will insist in the final contract. Applicants also would be asked to state their financial condition, ownership interests, and qualifications for the franchise award.

Franchising authorities should be aware that asking too much from applicants may cause as much trouble as asking too little. Although cable television franchises are widely regarded as “money-makers” (and the industry has indeed produced many millionaires), cable still has an uncertain economic future in the major markets, as discussed in Chap. 3. Consequently, if the RFP asks for a multitude of “free” public services or large capital investments beyond the requirements of the FCC rules, three kinds of response are likely.
First, some applicants may meet the terms of the RFP but expect to negotiate with the city to reduce them after the franchise award. An applicant may promise 40 television channels on a single cable, knowing full well that this is theoretically possible but not yet practical with present-day cable amplifiers or converters. The applicant may adopt a "promise 'em what they want" attitude if he feels the franchising authority's demands are so ill conceived that they are not likely to be enforced.

Second, an applicant may meet the RFP's terms but expect the FOC to invalidate them when the system applies for a certificate of compliance (step 8). He may agree reluctantly to install four parallel trunk cables if the city demands them, but then point out in his certification application that there is no present plan to use this capacity. Under these circumstances, the FOC presumably would not certify the system until the franchise provision were changed. In turn, however, this might prompt the franchising authority to reopen the bidding to other applicants.

Third, some potential applicants may refuse to bid at all. Anaheim, California, recently proposed a cable franchise requiring, among other things, (a) three parallel cables, (b) a separate cable system to serve municipal agencies, and (c) reservation of more than 30 percent of the system's total capacity for the city's use. One major cable company responded by withdrawing its earlier application, stating that although it "meets all of the City's legitimate criteria ... we have concluded that no responsible cable TV operator can or should submit a bid to the city of Anaheim" under the proposed franchise terms.1 Obviously, if other applicants reached similar conclusions, the city's franchising plans would have to be redrawn or postponed.

A delay in franchising may sometimes be desirable, of course. In some cases, such as Anaheim, the community may believe its interests are best served by not building a cable system until it can get all the facilities and services it considers essential. Since a large number of high-quality television signals are available to Anaheim off the air, city officials were evidently persuaded that only a cable system offering extensive new services was justified. Or a postponement may be the best solution to a particular local political situation. Still, a community should recognize the risks inherent in expanding its requirements substantially beyond those contained in the FOC rules.

Wide dissemination of the RFP is advisable. The franchising authority's choice should not be limited through either inadvertent omission or deliberate exclusion. Distribution of the RFP should include noncommercial as well as profitmaking

1 C4 TV, August 7, 1972, p. 3.
organizations. The National Cable Television Association can provide a list of commercial cable operators to whom RFPs can be sent. If potential noncommercial applicants have not made themselves known to the franchising authority by this time, organizations such as the Cable Television Information Center and the Office of Communication, United Church of Christ may help locate them.

If the city is interested in municipal ownership, it too could conceivably apply for the franchise. However, because municipal ownership is more likely to have been accepted or rejected during the planning phase, it usually would no longer be an issue at this time.

**STEP 6: HEARINGS ON PROPOSALS RECEIVED FROM APPLICANTS**

The FCC rules require public hearings at this step. They could be conducted in the same manner as previous hearings, but with time allocated for presentations and rebuttals by franchise applicants.

**STEP 7: DECISION ON AWARD OF FRANCHISE**

Selection of the winning applicant may be the most politically difficult step of all. The franchising authority must choose the applicant who proposes the package of rates and services that, on the whole, seems most attractive in light of the community's previously expressed desires.

Usually, the authority must make difficult choices among dissimilar elements. One applicant, for example, may offer a relatively low monthly rate—say $4—that is economic for him only if his visions of high revenues from new services come true. Another may propose a higher rate—say $6—but offer relatively elaborate local program origination facilities and a higher-quality signal. Yet another may offer a "regular" rate of $5.50, with a special preferential rate of $3.00 for the aged or poor.

The franchising authority will find no ready formula for making such decisions, but some procedural guidelines can be suggested. First, the authority should designate and make highly visible the areas in which it will recognize competing bids. If it has decided to require a minimum level of origination facilities but is flexible as to subscriber service rates, it should make clear that only the subscriber rates are...
subject to bidding. This approach not only will simplify the bidding for applicants, but also will make it easier for the franchising authority and the public to evaluate bids.

Second, the authority should measure each applicant's proposal against its own analysis, rather than simply balance one bid against another. This is particularly important in reviewing applicants' financial projections and proposed rate structures. The authority should have developed its own financial and service analysis before it even receives proposals, using its own staff or contracting with independent consultants. Some of the many questions to be asked include:

- On what basis does the applicant estimate annual growth and ultimate subscriber saturation in this particular market? Do these estimates appear reasonable considering the level of over-the-air broadcasting with which the cable operator will have to compete in signing up viewers?
- Are revenues based on conventional services or do they partly depend on new services yet to be perfected?
- Do capital expenditure items appear reasonable in light of experience in other cities?
- How do the cost estimates of local program origination facilities compare with estimates elsewhere?
- Do operating expenses such as payroll, pole rentals, property taxes, and selling and advertising expenses appear reasonable on the basis of experience elsewhere?
- Do the proposed debt-equity ratio and the rate of interest on debt seem appropriate, given the nature of the current capital market and the applicant's financial condition? Are the payback of debt and flow of prospective dividends estimated on grounds that would be regarded as financially prudent?
- Does the applicant have sufficient capital to build the system in accordance with his design and construction plan? Is there danger that he might have to sell control to other interests in order to build the system?

The last question is important, since a major objective of franchising is to select a cable operator who will actually build the system, rather than one who merely hopes to obtain the franchise and sell it at a profit to some other, more responsible group. The franchisor must beware of a phenomenon that has occurred in the past, in which "leading citizens" join together to obtain a franchise as a front or cover for some
other entity. On the other hand, the franchising authority may want to encourage ownership by local residents. The franchising authority must then consider whether the desirability of local ownership outweighs the risk of a financially strained or bankrupt franchisee.

Third, if the applicant operates other cable systems, the franchisor should check with authorities in those localities to evaluate his track record.

Fourth, the franchising authority should assign in advance a definite weight and priority to each factor on which bids are taken. These criteria should be stated publicly at the time an RFP or invitation to bid is issued. In its final decision, for example, it might give a weight of 10 percent to the proposed system’s initial capacity, 20 percent to its flexibility to expand and deliver new services, and 30 percent to subscriber service rates. It should then create scoring factors within each criterion; for example, a $4 bid for the monthly subscriber service rate might be worth ten points, an $8 bid worth one. Though mathematical precision in decision-making is obviously impossible here, the franchising authority might want to use a rough chart like that in Fig. 18 to help evaluate each application.

<table>
<thead>
<tr>
<th>CRITERION</th>
<th>PERCENT OF DECISION</th>
<th>SCORE</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>APPLICANT A</td>
<td>APPLICANT B</td>
</tr>
<tr>
<td>Initial System Capacity...</td>
<td>10</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>Flexibility for Expansion and New Services....</td>
<td>20</td>
<td>10</td>
<td>16</td>
</tr>
<tr>
<td>Subscription Rates.....</td>
<td>30</td>
<td>21</td>
<td>15</td>
</tr>
</tbody>
</table>

Fig. 18—Illustrative evaluation chart for franchise applications
Finally, the franchising authority should write a reasoned opinion explaining its decision on the franchise award. While it may sidestep this requirement by issuing a terse, perfunctory statement, the combination of citizen input, identification of bidding criteria, and evaluation of bids should nevertheless promote more rational and more open decisionmaking. The local authority's opinion also will be helpful in obtaining the FCC certificate of compliance, as discussed in the next chapter.

These steps taken together are in marked contrast to past experience in the franchising process. Many cities have entered into long-term franchises without soliciting competitive bids, and many franchise proceedings have been conducted with so little public notice that citizen participation has been feeble at best.

Terms and Conditions of the Franchise

A host of terms and conditions need to be taken carefully into account in the franchise document. The following is a list of categories discussed in a companion report:*

- Prefatory provisions
- Definition of terms
- Duration of franchise
- Exclusivity of franchise
- Broadcast signals to be carried
- Construction timetable
- Coverage within the franchise area
- Construction requirements
- Hiring practices and training
- Technical and operational standards
- Access to premises by cable operator
- Rates and other charges to the subscriber: general considerations
- Cable connection fees
- Monthly service rates, disconnection and reconnection charges
- Relocation charges

* Johnson and Bolein, op. cit.
Billing and payment procedures
Provision for temporarily reduced charges
Reduced rates for special classes of users
Establishing and adjusting the structure of rates
Setting rates and connection charges for basic and ancillary services
Review and revision of rates
Rates for new services
Allocation of channels
Facilities for public access to system
Minimum channel capacity
Interconnection of systems
Franchise fees
Provisions for transfer of franchise
Performance bonds
Liability for damages by the cable operator
Reporting requirements
Television set sales and leases
Maintenance of home antennas
Emergency use
Franchisor's rights
Separability, compliance with applicable laws, and noncontestability by grantee
Receivership
Cancellation and expiration

This Handbook can touch on only a few of the most important issues, particularly those that may require a special showing to obtain a certificate of compliance from the FCC. These include:

- Duration of franchise
- Sale, transfer, or assignment of the franchise
- Franchise fees
- Process of setting and adjusting rates for service
- Channel capacity and two-way capability
- Allocation of channels
- Facilities for public access
- Local technical standards
Duration of Franchise

The FCC rules state that generally it will not certify franchises running for more than 15 years. Recognizing that circumstances in particular communities may vary, however, it notes that "an applicant's proposal to wire inner city areas without charge at reduced rates might call for a longer franchise." Hence, any franchise extending beyond 15 years will need to be supported by a special showing before a certificate of compliance is issued.

The franchising authority also may want to include provisions for periodic review and, if necessary, renegotiation during the franchise term.

Sale, Transfer, or Assignment of the Franchise

The franchising authority should set clear guidelines for the sale, transfer, or assignment of the franchise. It will want to require prior approval by the authority before any such transaction can take place. Public hearings on any proposed transfer may be advisable, so that citizens can hear the reasons for it and can air their views. The authority also may want to limit transfers in the first few years more strictly, so that the winning bidder cannot soon sell out to another corporation at a fat profit.

Franchise Fees

Facing the great financial pressures so prevalent these days, many cities are tempted to view cable television as one more convenient source of revenue to be exploited for whatever it can bear. Competing applicants for franchises sometimes have found themselves prodded into bidding higher and higher fees to be paid to the city. The FCC and other groups have expressed great concern about the tendency for franchise awards to be based on the size of these fees. The operator can be squeezed so badly that his ability to serve the public is severely curtailed. In issuing its 1972 rules the FCC notes that...

... we believe some provision is necessary to insure reasonableness in this respect. First, many local authorities appear to have exacted high franchise fees more for revenue-raising than for regulatory purposes. Most fees are about 5 or 6 percent, but some have been known to run as high as 36 percent.
As a consequence, the FCC now limits franchise fees to 5 percent of total subscriber revenues and requires a special showing if the fee is more than 3 percent. The franchising authority must show that the higher fee is justified by a local regulatory program for cable. Thus, if a city were to set up a special regulatory agency to review subscriber rates, hear customer complaints, check technical quality of service, and monitor other elements of cable operations, the FCC might approve a 5 percent franchise fee to cover these added costs. The FCC Cable Television Bureau also has interpreted the rules to mean that franchise fees cannot be levied at all on advertising revenues, pay TV, or other new services.

However, some cities plan to challenge these interpretations before the full Commission and, if necessary, the courts. They contend that a city is leasing use of its streets and other property by the cable operator and therefore deserves a fair return for the lease. If this return is more than the city spends to regulate cable, they argue, the FCC has no right to intervene. They further question the Commission's authority to deny fees on new services. A final ruling on municipalities' power to levy franchise fees may be several years away.

It also remains an open question whether a higher franchise fee can be imposed to support local television programming by community groups. The Cable Television Bureau has stated that the Commission will consider the amount of money involved, together with "the danger that, through funding, local governments would control public access programming, and the possibility of other (funding) alternatives." Once again, however, the Bureau's view may not survive Commission or court review.

Procedure for Setting and Adjusting Service Rates

One of the most difficult problems is to establish a procedure for initially setting and adjusting rates in a manner that will be fair to both the cable operator and subscribers. The initial rates presumably will be those specified by the cable operator when he won the franchise, but changing them later may be difficult. On the one hand, general inflationary pressures may force periodic rate increases if the cable operator is to maintain a viable business. On the other hand, rate reductions may become possible through continued technological advance, economies learned through time and operating experience, and development and expansion of new markets.

The franchise should specify procedures for making rate adjustments. One possibility is regulation of the public utility type, which adjusts service rates to yield
the cable operator a "fair" return on his investment. The problem here is that "fairness" hinges on the allowed operating expenses and capital expenditures, depreciation policies, and the capital structure of the business. Few communities will have the staff resources to take such a close hand in regulating cable television. Although several states have authorities to regulate cable as a public utility, there is widespread agreement today that rate-of-return regulation would be premature for the cable industry.

A different approach is to have the local franchising authority approve rate adjustments after public hearings and a close review of the cable operator's financial condition. Criteria for deciding on rate adjustments would include:

- Estimates of how rate adjustments would affect the system's cash flow;
- The difficulty or ease of the cable operator's raising debt and equity capital;
- The effect on subscriber saturation;
- Whether the rate adjustment would differentially affect certain groups of subscribers, such as low-income groups.

Channel Capacity and Two-Way Capability

The FCC rules state that new cable systems in the 100 largest markets must be built with a minimum capacity of 20 channels. If the cable system carries more than 10 broadcast signals, channel capacity must be raised on a one-for-one basis so that no more than half the channels are used for conventional retransmission of broadcast signals. Thus, a system carrying 14 broadcast signals must have a minimum capacity of 28 channels.

A franchise in a major market may require more than 20 channels "upon a demonstration of need . . . and the system's ability to provide it," according to the FCC Cable Television Bureau. That is, additional channel capacity entails a cost, and to the extent that revenues from the additional capacity do not cover the additional cost, the cable operator can be caught in a financial squeeze similar to that of paying high franchise fees. Moreover, without plans to use the channels, initial capacity itself is not a particularly important criterion for awarding a franchise. Thus, cities should be prepared to justify requirements for channel capacities beyond the FCC minimum.

The rules also specify that major market systems must have "technical capacity for nonvoice return communications." No minimum standard of two-way capability
is set, however. A cable system could fulfill the requirement by carrying return
signals on a simple wire rather than on a cable, thus making it impossible to send
television programs up the cable from a remote studio or a school. Or the rule might
be satisfied by providing empty housings at each amplifier station with the
"capacity" for eventually holding equipment for the return link.

The FCC Cable Television Bureau has stated that franchises may require actual
installation of two-way video capability if there is a "plan for actual use" and if the
system operator can show "its feasibility both practically and economically." Still,
communities may find that initial system requirements—in terms of both total
channels and two-way capacity—are less important than the system's ability to
provide for new services in the future. In some cases, it may even be an expensive
mistake to install today's state-of-the-art devices. For example, it may be wise to wait
two or three years to install two-way equipment for remote medical diagnosis, until
better equipment has been developed that local hospitals are prepared to use. The
franchising authority must consider carefully tradeoffs among initial capacity, flexi-
bility for future expansion, and cost. These considerations are discussed in a com-
panion report.  

Allocation of Channels

For the same reason that the FCC fears high franchise fees, it has been con-
cerned about cable operators offering large blocks of free channels to schools or other
public agencies as a way of competing for the franchise. In response, the FCC has
ruled that the cable operator must supply only one channel for educational pur-
poses, one for public access, and one for government use, free of charge. Local
franchises can require additional access channels only if the community and cable
operator make a special showing to the FCC that they are "necessary and capable
of being used according to an existing, viable plan."

This policy raises several questions. First, if the city is not to have additional
free channels except under the special circumstances, is it entitled to other forms
of preferential treatment? For example, some franchises give city agencies monthly
service at a rate lower than that for ordinary subscribers. Nothing in the rules
directly prohibits preferential treatment to public agencies in terms of monthly
subscriber rates.

* Pilnick, op. cit.
A second question relates to wiring public facilities free of charge or under preferential conditions. Many franchises require the cable operator to wire schools and other public agencies gratis. As with preferential monthly rates to public agencies, however, this practice could inflict a substantial cost burden on the cable operator. Franchising authorities should tread cautiously in this area, for the Commission evidently intends to review requirements of free wiring or services on a case-by-case basis.

Third, the cable operator's obligation to supply the three free channels is ambiguous in cases where a single headend serves more than one community. Must he supply three separate channels for each community he serves from a single headend, or could the communities share each access channel? Indeed, how is a "community" to be defined? Is each governmental jurisdiction a community, or can several be combined for purposes of interpreting the rules? How are unincorporated areas (in some cases heavily populated) to be treated? These are questions of more than academic importance. Many situations may arise in which communities will find it in their mutual interest to coordinate franchises with a cable operator in order to exploit the economies of scale inherent in cable operations.

In response, the FCC states:

In some cases it may be possible for individual systems to share channel time. If this is the case we may be persuaded for instance that at least 2 shared public access channels will suffice for some conglomerate systems. Where boards of education are under the same jurisdiction, the problems may be alleviated. Local governments may agree to share time on one or two channels. We must, however, be given as much information in these respects as possible, together with specific proposals on the part of the systems. Until we receive such material certificates [of compliance] will not issue.

In short, communities contemplating the sharing of common headends and channels must submit a specific detailed proposal to the FCC.

Facilities for Public Access

The FCC's rules require the cable operator to supply only channel space, not studio equipment or facilities on the premises of educational and government institutions. However, he must provide studio facilities for the public access channel. Consequently, franchises may spell out general specifications for program origination equipment and studios. One would expect that the larger the subscriber base,
the more elaborate the facilities. Here, as elsewhere, franchise officials should not saddle the cable operator with costly obligations without a clear notion of the resulting public benefits.

LOCAL TECHNICAL STANDARDS

The FCC rules set minimum technical standards for broadcast television signals carried by the cable system. The operator must certify annually to the Commission that his system has been tested and meets these requirements. Many observers think, however, that these standards are too low for cable systems in large cities that must deliver high-quality pictures to compete with over-the-air television. In contrast, the Canadian Radio-Television Commission has issued a much more comprehensive set of standards for Canadian cable systems. Moreover, the FCC rules do not specify standards for the picture quality of locally produced programs or other nonbroadcast services.

Local franchises may specify additional or more stringent standards, according to the FCC Cable Television Bureau, if the city will enforce them itself. In deciding whether to write its own standards, the franchising authority must consider such questions as:

- What present or projected services will require new technical standards?
- Do market factors obviate the need for government enforced standards? (If picture quality is too poor, people won't subscribe to cable.)
- To what extent will more stringent technical standards require higher subscriber rates?
- Are present city staff qualified to write technical standards for cable? If not, how much will it cost to hire consultants to write them?
- What city staff or consultant resources will be needed to enforce the local standards? Will enforcement costs be covered from franchise fees or from general tax revenues?

Whatever the authority's decision on local technical standards, it should consider including a franchise provision that will incorporate new federal or state standards as they are adopted. For example, should the FCC establish certain frequency standards for upstream data transmission, the franchise might specify a
time period after which the local system must conform. The rapid development of cable technology and new services makes it likely that a number of new standards will be set by federal and state authorities during the initial franchise period. An advisory committee to the FCC is now considering technical standards.

IMPROVING AN EXISTING FRANCHISE

Although this Handbook emphasizes the drafting and award of new franchises, more than 4500 communities already have franchised cable systems. Few existing franchises contain all the provisions that the FCC rules now require in the major markets. What, then, can franchising authorities and community groups do in these cases?

If the cable system is located in one of the top 100 markets and was in operation by March 31, 1972, the operator has until March 31, 1977 (or until the franchise expires, whichever comes first) to install a 20-channel system and otherwise conform to the FCC capacity requirements. The franchising authority should make sure that the operator has a plan to meet that deadline. Since upgrading the system will take several months at a minimum, the operator’s final plans should be submitted for approval at least a year beforehand. This will also allow time to review any needed changes in the franchise, such as a provision for public hearings in rate adjustment proceedings. Otherwise, all parties may suffer from a rush to finish in time or a delay while they submit an unnecessary request for waiver from the FCC.

Other events may accelerate the process of system upgrading. For instance, if a “grandfathered” major market system receives FCC certification to carry additional broadcast signals—either local or imported—it must at the same time make available one access channel for each new broadcast channel. The rules state that the system must provide access channels “in the following order of priority: (1) public access, (2) educational access, (3) local government access, and (4) leased access.”

Of course, franchising authorities and community groups can negotiate with the operator for other improvements of an existing franchise. Negotiation is generally the best course to follow for systems outside the major markets, since the FCC access and system capacity requirements do not apply to them. However, the Commission has stated its intent in certain areas—such as the provision of at least 12-channel capacity “eventually . . . in all systems”—so that a community might
appeal to the FCC if it could not reach agreement with the cable operator on major improvements.

**USING CONSULTANTS EFFECTIVELY**

In nearly every chapter, this Handbook suggests that local officials and community groups use independent experts and outside advice. The reasons are clear enough:

- Building a cable system entails a long-term commitment and a large capital investment. Tens of millions of dollars will be needed in the major cities.
- Planning and franchising a cable system to provide more than simple television reception service is exceedingly complex.
- In major markets, the local government and the community must find uses for the education, government, and public access channels.

Moreover, most franchise applicants will have gained considerable expertise from building other operating cable systems. But the community grants its franchise only once. Psychologically, local officials and others may feel much like a first-time auto buyer visiting a row of used-car dealers. They will see a clear need for obtaining some counterweight in the negotiations.

**How to Find Consultants**

A community may realize it needs outside expertise but not know where to look. The first problem is to define the kind of help required. Four categories of consultants are shown in Table 17, along with some specific tasks they might be called upon to perform during the decisionmaking process. Many of these categories are interrelated, however, and the tasks cannot be performed separately. The technical design for two-way services, for example, depends both on an assessment of community needs and on close analysis of the economic tradeoffs involved.

Fortunately, although people who are competent in all key areas are rare, many consultants are accustomed to dealing with interdisciplinary problems. A still better approach, if funds are available, is to use a consulting team that might include a communications engineer, a financial analyst, and a social scientist skilled in assessing demographic patterns and community interests.
Table 12

REPRESENTATIVE TASKS FOR CABLE CONSULTANTS

<table>
<thead>
<tr>
<th>Consultant Category</th>
<th>Planning</th>
<th>Franchising</th>
<th>Regulating and Managing Public Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical</td>
<td>Provide technical information</td>
<td>Prepare performance specifications and monitor procedures</td>
<td>Monitor construction and certify proof of performance</td>
</tr>
<tr>
<td></td>
<td>Explore alternative system designs and feasibility of new services</td>
<td>Analyze franchise applications</td>
<td></td>
</tr>
<tr>
<td>Economic</td>
<td>Develop financial projections and tradeoffs for alternative designs</td>
<td>Analyze franchise applications</td>
<td>Evaluate costs of new services</td>
</tr>
<tr>
<td></td>
<td>Conduct market survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Community Services</td>
<td>Develop community priorities for cable services</td>
<td>Develop guidelines for use of access channels</td>
<td>Assist community involvement in use of access channels</td>
</tr>
<tr>
<td></td>
<td>Aid community groups in collecting and articulating their views</td>
<td>Analyze franchise applications</td>
<td>Access system performance via face-to-face community needs</td>
</tr>
<tr>
<td>Legal</td>
<td>Clarify appropriate federal, state, and local regulations</td>
<td>Recommend franchise language</td>
<td>Assist in the FCC certification procedure</td>
</tr>
<tr>
<td></td>
<td>Review franchise for conformity with federal, state, and local regulations</td>
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</table>

Once the tasks are defined initially, consultants can be sought out and interviewed. Although there is no "cable consultant" listing in the Yellow Pages, some consultant lists are available in trade directories such as the *Television Factbook*, or from the National Cable Television Association and its state affiliates. The Cable Television Information Center, the National League of Cities, and the International City Management Association may be of assistance. Officials in nearby communities that have already franchised cable systems may be able to give individual referrals.

Communities should recognize, however, that as yet no standards have been established for cable consultants, in terms of either education or experience. Consequently, the franchising authority or community group should refer to the consultant's past clients for their evaluation of his competence and performance. But even
if the community selects consultants with impressive backgrounds and excellent achievement records, it may use them to solve the wrong problems rather than the right ones.

**Uses and Misuses of Cable Consultants**

Some disillusioned clients insist that the major output of a consultant hired to solve a problem usually will be a lengthy report recommending further study. Some frustrated consultants believe that no matter what problem the client asks the consultant to solve, the real problem usually turns out to be the client. There is some truth to both viewpoints.

Between these poles, basic guidelines can be stated simply: use consultants to provide information, to explore and evaluate alternatives, and to make policy recommendations, but not to make policy *decisions*. The client city or county cannot transfer its decisionmaking responsibility to the consultant, and it should not try to do so. The client can, however, use consultants’ advice and information to arrive at more reasonable decisions.

If a vacuum persists in the policy and decision areas, most competent consultants will attempt to fill it, consciously or unconsciously, as best they can. The consultant’s recommendations may be persuasive enough to lead automatically into policy. They may even on occasion prove to be *good* policy, but the risk is the client’s, and all parties should be aware of the potential harm. At the very least, consultants and clients have different objectives, priorities, and constituencies that make this type of situation perilous.

Brought down to earth in the specific tasks of cable television franchising, these generalities can be categorized as shown in Table 18. Obviously, there will be exceptions to such simplified listings. Many of the “don’t use” strictures will not apply if the client firmly controls the decisionmaking process. For example, the consultant should not unilaterally establish and attempt to impose quantitative weightings and priorities for evaluating cable franchise applications (e.g., 30 percent for adequacy of programming studio, 10 percent for channel capacity, and so forth). He can serve the client, however, by preparing an initial set of such recommendations that the client can modify and use. Again, it is essential that the client do more than give rubber-stamp approval to a consultant’s advice.
<table>
<thead>
<tr>
<th>Do</th>
<th>Maybe</th>
<th>Don’t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use consultants to provide input to local decisionmakers; e.g., they may:</td>
<td>Use consultants to:</td>
<td>Use consultants to make decisions for the local franchise authority; e.g., they should not:</td>
</tr>
<tr>
<td>Work with community groups and municipal agencies to specify needs and objectives</td>
<td>Define the scope of the consulting assignment (in conjunction with client)</td>
<td>Determine franchise district boundaries</td>
</tr>
<tr>
<td>Provide state-of-the-art technical data</td>
<td>Help defer franchising decisions (if there is good reason for deferral)</td>
<td>Set priorities among community needs</td>
</tr>
<tr>
<td>Forecast technology trends and limitations</td>
<td>Validate prior decisions (if they can be validated)</td>
<td>Establish system design objectives and constraints</td>
</tr>
<tr>
<td>Explore alternative system designs</td>
<td>Help negotiate franchise agreements</td>
<td>Decide on specific terms of the franchise</td>
</tr>
<tr>
<td>Estimate subscriber saturation</td>
<td>Troubleshoot problems on an existing cable system</td>
<td>Decide on weighting factors for evaluation of applicants</td>
</tr>
<tr>
<td>Evaluate the costs of new services</td>
<td></td>
<td>Make tradeoff decisions</td>
</tr>
<tr>
<td>Prepare performance specifications, requirements, and standards</td>
<td></td>
<td>Select the franchisee</td>
</tr>
<tr>
<td>Point out problem areas</td>
<td></td>
<td>Allocate use of access channels</td>
</tr>
<tr>
<td>Analyze franchise applications</td>
<td>Review system performance</td>
<td>Determine responsibility for franchise monitoring and enforcement</td>
</tr>
</tbody>
</table>

**Costs**

The costs for professional consultant assistance in the cable television field parallel those in other specialized areas where equivalent experience is required.

Typically, consultant organizations have billing rates of 2 to 3 times the direct compensation of the consultant(s) used on the assignment. Thus, if the task calls for a consultant who might be expected to earn $25,000 a year, or $100 a day in private industry, the fee for his services would range from $200 to $300 a day, plus travel and other direct expenses. Lower rates are possible for individuals operating with little or no overhead or support expenses, such as some university faculty members. Higher rates are also possible when special qualifications, short assignments, or organizations with high overhead facilities are required.
The daily rate, however, is considerably less important than the effective productivity of the consultant. A doctor whose office fees are low, but whose patient recovery rate is also low, is no bargain.

Productivity (in terms of useful output, not number of pages in the report) is difficult for the client to judge in advance. Still, some techniques can help. First, as noted, the client should refer to previous clients for whom the consultant has worked. This can confirm both the adequacy of performance and the level of expertise claimed. In a field with no established standards, such word-of-mouth review is critical.

Second, the assignment should begin with a relatively small, limited-risk first phase. Performance during this phase and a critique of output will enable the client and consultant to take each other's measure and establish a harmonious approach to subsequent major tasks. Phased tasks are particularly important in the cable television franchising process, since so many parameters are interdependent. The franchising authority should review each phase of the consultant's work, not only to check competence, but also to be able to modify the tasks or set new priorities before a final set of recommendations is prepared.

Where the scope and duration of a consultant assignment cannot be defined within tolerable limits, the man-day billing rate is applied. When a definition of scope can be mutually agreed on, a fixed-price or ceiling-price assignment usually is preferable.

Local governments often find that their normal budgets have no provision for hiring cable television consultants during the franchising process. One possibility is to insist on a substantial filing fee from each franchise applicant to pay for consultant assistance, but even a fee of several thousand dollars may not cover costs. The justification for spending additional local tax dollars is that opportunities may be lost and even greater costs incurred if prefranchise planning is inadequate.

Using consultants, of course, does not guarantee that franchise decisions will be wise, forward-looking, or even rational. Yet it is difficult to argue that a community will not benefit from a professional view of the technological, financial, community service, and legal alternatives open to it in cable television franchising.
SUMMARY CHECKLIST

- Has the franchising authority considered the many terms and conditions of the franchise listed in the chapter?

- Has the use of consultants to provide information and explore alternatives been considered?

- Have public hearings on the draft franchise document been held?

- If the competitive bid and award approach has been adopted, has the franchising authority drafted a request for proposals (RFP), indicating which franchise provisions are open for competitive bidding?

- Has the RFP been disseminated as widely as possible to noncommercial and commercial organizations?

- Does the RFP require full disclosure of the applicant’s financial, ownership, character, technical, and other qualifications for the franchise award?

- Has the franchising authority conducted an independent analysis of the area’s economic potential for cable with which each applicant’s response can be compared?

- Has each applicant’s track record in operating cable systems in other communities been assessed?

- Has the franchising authority analyzed each applicant’s ability to build and operate the system on his own?

- Have definite criteria and weighting factors been established to aid in selecting the franchisee?

- Has the franchising authority given effective public notice, held public hearings, and published a written opinion in granting the franchise award?
Chapter 7

LOCAL RESPONSIBILITIES BEYOND THE FRANCHISE AWARD

The local franchising authority's job does not end with its award of the cable franchise, nor does the work of the citizen groups. Indeed, many community responsibilities only begin at that point. Figure 19 depicts the local regulatory process after the franchise award.

STEP 8: APPLICATION FOR FCC CERTIFICATE OF COMPLIANCE

Procedure Under the FCC Rules

Under the 1972 FCC Cable Television Report and Order, a newly franchised cable system must secure a "certificate of compliance" from the Commission before it may carry broadcast television signals. A certificate would not be required for non-broadcast cable operations such as pay TV, local origination programming, or educational and municipal services. Realistically, however, it is a necessity, since present cable systems count on broadcast television distribution as their basic moneymaking service.

The certificate is sought by the cable operator, not by the local franchising authority. In his application, the operator must provide a copy of the franchise and
Fig. 19—The local regulatory process

basic information about his business operations. He also must show that his operations under the franchise will be consistent with the FCC rules, specifically including his plans for carrying broadcast signals and for administering the education and public access channels.

The operator must give formal notice to the franchising authority that he is seeking a certificate of compliance. Thus, the appropriate local official—usually the city attorney—should expect to receive a copy of the application for certification and should be prepared to take any action the local franchising authority deems necessary in supporting or opposing the application. This action must be taken without delay, since the rules provide for only a thirty-day period after the FCC gives public notice of the application in which to file objections. The operator also must give notice to any state agency that has or claims regulatory authority over the system and must, of course, conform to any state requirements.

The Special Showing

In particular, if any franchise terms depart from the FCC rules, both the franchising authority and the cable operator must justify them in the application for a certificate of compliance. A "special showing" will be necessary, for example, if the franchise

- Runs for more than 15 years,
- Requires franchise fees greater than 3 percent of total subscriber revenues,

1 The relevant FCC forms used by the operator are reproduced as an appendix to Rivkin, op. cit.
- Requires more than 20-channel capacity,
- Requires more than one free channel for education, local government, or public access,
- Establishes a citizen panel to administer the public access channel,
- Requires the cable operator to establish a special fund for public access production,

and so forth. The special showing should detail as specifically as possible the community’s reasons for going beyond the federal rules. The FCC guidelines outlined in the previous chapters and discussed more fully in the companion reports give some basis on which to proceed in drafting a special showing.

Should the FCC not be convinced by the special showing, it will not issue a certificate until the offending franchise provisions are changed. This need not require a new ordinance if the franchise contains a "severability clause" that would invalidate these provisions while leaving all others intact. However, the local authority may well want to reopen the franchising process if the invalidated provisions were a major factor in choosing the winning applicant over others. For example, the franchise might have required a special fund for community programming over and above the franchise fee, with the chosen applicant promising $50,000 more than his competitors. Should the FCC invalidate this provision as overburdening the operator, losing applicants would have good reason to complain. A new bid and award procedure may be the best solution in such a case.

Participation by Citizens and Community Groups

Citizens also can express their views during the certification process. If a citizen group, for example, feels that the FCC requirement of a "public proceeding affording due process" has not been met, it may complain directly to the FCC. It can also recommend a provision—a certain method of handling subscriber complaints, for example—that is not contained in the franchise. An objection need not follow a complex legal form, but must "give service" to the FCC that it is an objection for the record and not merely correspondence. Although it is not absolutely necessary

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1 For an example of such a clause, see Johnson and Botein, op. cit.
to retain a skilled communications attorney to draft an objection, expertise in these matters is always helpful. Some sources of aid and advice for community groups are listed at the end of the Handbook.

Citizens must find out when the application for certification is filed, since the FCC rules do not require the cable system or the franchising authority to give them formal notice. Interested groups may write to the operator when he receives the franchise award, asking that he send them copies of his application for a certificate when he submits it to the FCC. These groups must then be prepared to respond quickly, since the thirty-day limitation applies to them too.

Citizens and community groups also may want to join with the franchising authority and the cable operator to support a special showing. For example, a franchise requirement for a second public access channel is far more likely to win FCC approval if the community can demonstrate specifically how it will be used. Letters from community groups stating their intent to produce programs on a regular basis and specifying their source of funds for programming would help in showing that the second access channel is, in the FCC's words, "necessary and capable of being used according to an existing, viable plan."

Special Waivers and Rulemaking Petitions

Apart from the special showing, cable operators, broadcasters, or any other "interested person" can ask the FCC to waive a particular rule that applies to them. A waiver request, also known as a petition for special relief, can be submitted at any time, not solely when a certificate of compliance is sought. A cable operator with more than 3500 subscribers can request that he not be required to originate programming, or an educational television station can ask that cross-ownership restrictions be waived so that it can own the community's cable system. Community groups and local governments may also request waivers, although few have done so in the past.

It is probably more important that community groups be prepared to respond to waiver requests than to initiate them. The FCC usually hears only from one side when it passes on a waiver application. Moreover, the Commission staff is not large or expert enough to determine the accuracy of statements in all the applications that come before it. If no one speaks for the community, then, the FCC may equate silence with consent and grant the waiver petition almost automatically.

As with the certification procedure, applicants for waivers need not notify com-
munity groups who are not directly involved. As a result, it may be wise for concerned groups to write the cable operator, stating that the group is an "interested person" which desires copies of any petitions for special relief. If the group then decides to oppose a waiver request, it should marshal its points in as detailed a manner as possible and give service to the FCC within the required thirty-day period. Again, the submission can be in letter form with no attorney needed, although good legal advice should help a group to make its case more persuasively.

Finally, any person or group can petition the FCC to make a new rule or modify an existing one. The petition may be denied, of course, but the Commission cannot ignore it; and some petitions have successfully impelled the Commission to consider new policy issues. For example, during the summer of 1967 the Office of Communication of the United Church of Christ filed a three-page petition requesting the FCC to outlaw racial discrimination by broadcasters, telephone companies, and cable systems. In response, the Commission first adopted a general policy against racial discrimination and later issued a comprehensive set of rules.

STEP 9: MONITORING SYSTEM CONSTRUCTION AND CERTIFYING PERFORMANCE

After FCC certification, the franchising authority must ensure that the cable system is constructed in compliance with the terms of the franchise. It will want to monitor the pace of construction and the hiring practices of the contractors, as well as the contractors' quality control procedures. In many cases this can be done by city inspectors, although engineering specialists will be needed for systems that are to deliver more than television services. As an example, expert monitoring definitely will be necessary if the city expects to use the cable system for two-way communications among municipal agencies at any early date.

However simple or complex the system, its performance should be checked at several stages of construction. If performance tests are deferred until the system is ready to be "turned on" for subscribers, technical problems or variances from franchise terms may be difficult to correct. Instead, the franchising authority should make certain when the headend is completed that television signals delivered to the cable are of adequate quality. It might then check performance at the ends of the first feeder cables when they are installed. The franchise presumably will also include provisions for more formal "certification of performance" at the completion
of each construction phase. The city may be able to certify performance on its own if it has the necessary equipment and technical staff. Most communities will hire a technical consultant for this task, however. The question of who pays for system certification should be decided before the franchise is awarded.

**STEP 10: CONTINUING ADMINISTRATION OF THE FRANCHISE**

During the postfranchise period the cable operator, the franchising authority, and the community must live together on a day-to-day basis. Disputes undoubtedly will arise about services, rates, and many other issues. The FCC rules require only that:

The franchise shall specify procedures for the investigation and resolution of all complaints regarding the quality of service, equipment malfunctions, and similar matters, and shall require that the franchisee maintain a local business office or agent for these purposes.

**Determining Local Responsibility**

It is easier to specify procedures than to enforce them. First, the city must decide who will be responsible for continuing administration of the franchise. Some large cities may be able to establish an Office of Telecommunications with full-time staff, as New York City has done. An adequately staffed city agency could monitor cable system operations on its own—by having technicians make spot checks of television picture quality, for example—and respond to subscriber complaints. Other cities might add staff to an existing utilities department or consumer affairs agency to perform these functions. Small communities may be able to add these duties to those of present city employees.

Whoever has responsibility, administering the cable franchise costs money. Many communities will find, in fact, that they spend more on franchise administration than they collect from franchise fees. As discussed before, an active local regulatory program can justify a larger municipal share of cable revenues under the FCC rules.
Creating Effective Enforcement Mechanisms

Next, the city must determine what enforcement mechanisms or penalties it will invoke when citizens register valid complaints against the cable system. Two principal approaches have been used. One is to define operating standards in a general way in the franchise and negotiate with the cable system for corrective measures when necessary. For example, the New York City franchises for Manhattan state:

The Company shall furnish to its subscribers and customers for all services the best possible signals available under the circumstances existing at the time, to the satisfaction of the Director of Communications . . .

Other cities have used similar language.

In principle, the advantages of this approach are that a city retains great flexibility in handling complaints and can negotiate with the operator from a position of strength, since it has final authority to terminate or not renew his franchise. However, the advantages in practice remain to be seen. Moreover, franchising authorities should bear in mind the problems they may encounter with this approach:

- There are no objective standards for determining the validity of subscriber complaints;
- A city must decide in each instance how many complaints are needed before it should act;
- Citizens have no objective way of measuring the performance of the enforcement agency;
- The city is vulnerable to charges, however unfounded, that it selectively enforces complaints or otherwise deals under the table with the operator;
- The "ultimate sanction" of franchise termination or nonrenewal simply may not be credible in dealing with minor, day-to-day problems.

The second approach would attempt to set specific operating standards and appropriate penalties for noncompliance in the franchise. The franchise might specify a maximum time for the operator to respond to subscriber complaints (for example, same-day response if the complaint is received before noon). It might set standards for system reliability in terms of the number of service interruptions per year, or establish picture quality standards over and above those contained in the FCC rules. For each of these examples, the penalty for noncompliance might be a rebate of part of the monthly fee to each affected subscriber.
It is relatively easy to enforce specific standards in an open and straightforward manner. The disadvantages of the approach are that the franchising authority and the operator may be unable to agree on operational standards, that the desired standards may change over time, and that the city has less flexibility to take special factors into account in enforcement. In essence, this approach is like handing out tickets for minor traffic offenses, rather than negotiating with the violator to improve his behavior under threat of revoking his driver's license. And while states do revoke drivers' licenses, there is no evidence to date that municipalities will revoke or refuse to renew franchises.

Perhaps the best solution is a combination of the two approaches. Operational performance standards might be included in the franchise where they can be reasonably determined, with appropriate penalties for noncompliance. Where setting operational standards is difficult—as, for example, the picture quality of locally originated programming from remote sites—the city must rely on negotiating any needed improvements.

Citizen Participation in Franchise Enforcement

Although the franchising authority has legal responsibility to regulate the franchise, community groups and individual citizens can help assure good performance from the cable operator in several ways. First, all subscribers should be notified of how to submit complaints to the city. They should be encouraged to speak up when they do not receive services they are entitled to under the franchise. If one area receives significantly poorer pictures than the rest of the city because it lies at the end of an overly long feeder line, a neighborhood council might collect complaints for mass submission to the franchise enforcement agency. Second, community groups can play an active role in system certification and waiver proceedings before the FCC, as described above. Finally, individuals and groups can use their local political power to effect improvements through the franchising authority, or, if necessary, the courts. A citizens' suit to force the operator to produce an affirmative action program for minority hiring might be one example.

However, it is always wise to negotiate with the cable system before making a formal complaint. Negotiation is usually more effective, cheaper, and less time-consuming than litigation. Besides, the objective of franchising is to ensure a long-term, harmonious relationship between the cable system and the community. A harassed or financially strained cable operator is not likely to do his best to make the cable system serve community needs.
Managing Public Services on Cable

Community groups as well as the local government can participate in the administration and use of the education, government, and public access channels mandated by the FCC for major market cable systems. These uses are the subject of the next two Handbook chapters.

SUMMARY CHECKLIST

- Are the franchising authority and citizen groups prepared to:
  - comment on the cable operator's application for a certificate of compliance from the FCC?
  - join in any special showings necessary to gain FCC certification?
  - initiate or respond to waiver petitions?

- Have plans for monitoring system construction and certifying performance been drawn?

- Has responsibility for administration of the franchise been delegated?

- Have effective procedures been adopted for resolving subscriber complaints and enforcing franchise provisions?

- Is the local regulatory program adequately staffed and budgeted?
Chapter 8

MAKING PUBLIC ACCESS EFFECTIVE

Cable television makes it technically and economically possible for many local voices to be heard—and faces seen—on television. That may well be cable's most profound influence on community life. But as the first experiments in Canada and New York City have shown, dedicating a cable channel for community programming or "public access" is not enough. Community groups and individuals interested in presenting their ideas must know that television time is available to them. They must have access to production facilities, equipment, and technical assistance. They need funds for programming. And they must attract a local audience if community origination is to be more than a chance to blow off steam.

When these pieces are put together, public access can benefit both programmers and viewers. In New York City, for example, a neighborhood group had tried without success to have a spotlight placed at a dangerous street corner. Using inexpensive, portable equipment, group members made a videotape documenting the situation and showed it on the cable system's access channel. Forty people turned out for their next meeting to discuss the problem. That meeting, too, was videotaped and aired, and even more viewers responded. Soon, enough local pressure was generated that the spotlight was installed. Through public access, the neighborhood group had imparted information, influenced opinion, extended its own base of support, and helped build an increased sense of neighborhood identity.

This chapter discusses how public access can be encouraged through franchise provisions and the community's own organizing efforts. Political, legal, and financial issues must be resolved. But a principal barrier to effective public access is psychological. Most people think of television production only in terms of highly trained,
well-paid professional entertainers and technicians. Because it is so foreign to their
daily lives, many citizens will neither understand nor be interested in public access
when the tools become available to them; others will be afraid of it. Those who do
step forward will need help to use the equipment and channel time effectively.¹

LOCAL CABLECASTING AND PUBLIC ACCESS

The FCC has distinguished two primary outlets for local programming on cable.
First, cable systems with more than 3500 subscribers must originate local program-
ming "to a significant extent," although this phrase is not further defined in the FCC
rules. The cable operator must designate one or more local programming channels
that can be used for no other purpose. The FCC permits him to present commercial
advertising on these channels. His programming can include television reruns and
other purchased tapes and films, but the FCC's intent is to encourage local produc-
tion by the cable system. Many operators provide "automated" services, such as time
and weather information, wire service news, and a stock market ticker, on these
channels, but they do not count as local cablecasting.

As of March 30, 1972, Television Factbook data show that only 17 percent of U.S.
cable systems had more than 3500 subscribers and thus were subject to the ca-
blecasting requirement. In fact, slightly more than 20 percent of systems originate
programs other than automated services. They televise local high school football
games, cover city council meetings, present local news and public affairs, and pro-
duce programs for children and other local audiences. Although the funds spent on
cablecasting are tiny compared with broadcast television budgets, some innovative
local programs show cable's potential to serve specialized audiences. "Kids Today,"
produced by the Malden, Massachusetts cable system, and "Just Imagine," produced
by the system in Findlay, Ohio, are two examples of children's programs that have
won wide critical acclaim. The National Cable Television Association regularly
presents awards for local cablecasting.

Some systems encourage local groups to use their studio facilities, or they play
tapes produced by local groups on a cablecasting channel. Some operators provide
time for citizens to air their views on local issues. But so long as these programs are
presented on a cablecasting channel, the operator has full control over what is said

¹ Much of the information in this chapter is discussed more fully in the companion report by Richard
C. Kletter, Cable Television: Making Public Access Effective. R-1142 NSF.
and who says it. It is his channel, to use as he sees fit. His interest in gaining
subscribers and selling advertising time may conflict with the interests of citizens
who want access.

In contrast, the FCC rules provide for a separate public access channel in all
new cable systems serving communities within the top 100 television markets. The
FCC requires the cable operator to establish rules for the public access channel that,
as a minimum, contain these provisions:

- Public access must be on a first-come, nondiscriminatory basis.
- Advertising is prohibited for commercial products or services, or on behalf
  of any candidate for public office.
- Lotteries and obscene or indecent matter are prohibited.
- Facilities for live studio presentations of five minutes or less must be
  provided free of charge. Charges for programs of more than five minutes,
  and other fees, "must be consistent with the goal of affording the public a
  low cost means of television access."
- Public inspection of the names and addresses of all persons or groups
  requesting access time must be permitted. The operator must retain such
  records for two years.

Beyond the above restrictions, the cable operator cannot exercise control over who
uses the channel and what content is presented. He must file a copy of his rules with
the FCC within 90 days after he first puts the public access channel in operation.
The rules must also be available for public inspection at the cable system's office.

The FCC rules also require one channel for education and one for local govern-
ment access in new major market cable systems. The use of these channels is the
topic of the next chapter.

SETTING THE RULES FOR PUBLIC ACCESS

The above requirements for a public access channel leave many questions to be
resolved at the local level. These include:

* Note that the requirements for public access and local cablecasting channels are not the same. Some
  suburban cable systems within a major market may have less than 3500 subscribers. Consequently, they
  must provide a public access channel (possibly sharing studio facilities with nearby systems), but they
  need not do their own cablecasting. Conversely, large systems outside the major markets must originate
  programming, but need not provide a public access channel unless their franchise requires it.
- Administering the public access channel.
- Program scheduling.
- Use of production facilities and equipment.
- "Quality" standards for access programming.
- Charges for production costs.
- Funds for public access.
- Access to grandfathered systems and those outside the major markets.

Each community will want to consider these issues during franchising or through separate negotiations with the cable operator.

**Administering the Public Access Channel**

Although the cable operator retains final authority for administering the public access channel under the FCC rules, the community may want to vest responsibility in other hands. If so, a special showing to the FCC by both the cable operator and the franchising authority will be necessary. For example, the local franchise might establish a Public Access Board to resolve any disputes over first-come, first-served time allocations or other questions regarding equal treatment of access users. The Board also could promote the use of access time among community groups and individuals, conduct training classes, raise funds for access programming and equipment, and publicize access programs. The Board might be composed of community group representatives and individuals elected by neighborhoods. Electing representatives to the Board might insure that it will not be captured by the local government or by particular interest groups.

If such a Board were established, the special showing to the FCC would detail how the Board would function and what community needs it satisfies. Financial support for the Board's activities must also be provided, of course. Still, if the community stands solidly behind it, the FCC is more likely to approve the Board's creation. The cable operator might also welcome it, since it would remove a time-consuming and unrewarding burden from his shoulders. The operator even might appoint such a group himself if the franchise does not require it. Recent guidelines for access published by the National Cable Television Association (NCTA) recommend that "cable operators should consider the formation of broad-based democratically constituted groups to advise and assist in policy development, promotion and funding for public access."

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Operators often have opposed the Public Access Board idea, arguing that they will remain legally liable for misuse of the access channel even if someone else administers it. The FCC has tried to reassure operators on this point, noting in the 1972 Report and Order:

Many cable operators are concerned about potential civil and criminal liability resulting from use of these public and leased access channels. There is little likelihood of the possibility of a criminal suit in a situation where the system has no right of control and thus no specific intent to violate the law. ... The real fears of cable operators seem, in fact, to center on potential libel suits. The possible number and scope of such actions is, however, severely limited. ... We have adopted the no-censorship requirement in order to promote free discourse: that is, we believe, valid regulation having "the force of law."

In practice, New York City's year and a half of experience suggests that the problem of libel and slander suits resulting from public access is probably far less significant than operators have feared.

Program Scheduling

Commercial broadcast experience shows clearly that regular program scheduling increases audience size and impact. This will be true for public access programming as well. For example, the Deafness Research and Training Center has presented programs for the deaf, in sign language, on New York City's public access channels. Without the same time slot each week, the intended audience probably would never see this programming, since few deaf people regularly watch television.

Communities therefore should place high priority on scheduling regular time periods for serious, regularly produced, public access programs of more than five minutes. On the other hand, the first-come, first-served nondiscriminatory criterion may conflict with reserving access time far in advance. A solution would be to require two public access channels, as New York City has done: one for five-minute segments on a strict first-come, first-served basis, and the other permitting regular program scheduling over extended periods. Requiring a second public access channel by franchise, however, would require a special showing to the FCC. Other possible ways to provide regularly scheduled programming include:

- Certain hours on the public access channel could be reserved for regularly scheduled programs, with the remaining time available for first-come, first-served programming.
- Unused time periods on the education or government access channels could be borrowed for regularly scheduled public access programs.

- Programs produced by community groups could be scheduled on a cablecasting channel. The cable operator may welcome and even solicit programming for his cablecasting channel, but he can then exert control over program content.

- Regularly prepared programs can be interspersed with short segments throughout the program day on the public access channel. This would greatly lessen the impact of regular programs but might increase audience size for programs of the first-come, first-served variety.

Whatever the choice, some limits will be needed to insure that a few organizations do not dominate reserved channel time. Limiting any person or organization to a certain number of hours per week, with further restrictions on evening prime time, seems in order.

Use of Production Facilities and Equipment

The FCC rules require that the cable operator "maintain and have available for public use at least the minimum equipment and facilities necessary for the production of programming for [the public access] channel." In defining what this means, the NCTA guidelines state:

We believe that where economically feasible, provision should be made for a studio in good operating order with at least two cameras, two video tape recorders and the basic attendant studio equipment (lighting, etc.). Beyond this, the amount and type of equipment should be a function of demand. The equipment should be in good operating condition, providing a level of technical quality consistent with the user's offering. Experience thus far indicates it is important to have as high a level of technical quality as possible, in order to attract and maintain the interest of viewers accustomed to good quality. . . . Provision should also be made for the system to provide a qualified television production person to offer technical assistance during reasonable business hours.

These guidelines seem sensible. However, a community may choose to go beyond them or define different requirements. For example, a city may want to have several local access studios in different neighborhoods rather than one central facility. In many cases, requiring this in the franchise would not be overly burden-
some to the cable operator and would not require a special showing. However, the franchise authority should estimate the cost of additional facilities or equipment dedicated to public access beyond that suggested in the NCTA guidelines, to determine whether a special showing will be necessary. An applicant’s commitment to community origination, as measured by his proposed investment in facilities, equipment, and programming staff, could in fact be one important criterion in awarding the franchise.

A small studio for cable programming is illustrated in Fig. 20. It contains more than the minimum equipment described in the NCTA guidelines.

Fig. 20—A small cablecasting facility
Access groups may find other sources of facilities and equipment beside the cable operator. For instance, public television stations might make studio facilities available for public access production. Arrangements would have to be made with the local station manager. A few public television stations such as WGBH in Boston provide time themselves for public access on their UHF broadcast channels.

"Quality" Standards for Public Access Programming

Community groups and individuals often will produce videotapes on portable equipment for playback over the public access channel. Portable half-inch videotape recorders, such as the Sony Portapak illustrated in Fig. 21, have begun a true communications revolution. They enable large numbers of people to produce programs for television. The FCC clearly favors this trend: "Hopefully, colleges and universities, high schools and recreation departments, churches, unions and other community groups will have low cost video taping equipment for public use."

Videotapes produced with half-inch equipment, however, seldom equal the technical quality of those produced under studio conditions with more costly equipment. Likewise, much of the programming produced by amateurs will be technically poor. Some cable operators, in their roles as administrators of the public access channel, have refused to show videotapes they considered of inferior technical quality. Their business is based on providing excellent reception service, they contend, and subscribers will blame them for poor-quality pictures even when the fault lies with the program materials. Indeed, the NCTA guidelines suggest, "The cable operator may require reasonable technical standards in software submitted by a user."

Many community groups, however, see "technical standards in software" as an excuse for operator censorship of program content. The purpose of public access, they contend, is to assure the greatest diversity of ideas and opinions, even if a few faces are blurred and voices are less than crystal clear. Some of the most effective half-inch videotapes have been made under poor lighting conditions or in other circumstances that lower their technical quality.

All told, the case for enforcing technical standards on public access programming seems weak, especially for programming that could not be reproduced in live studio presentations. Videotape users should work with the cable operator to assure that adequate playback equipment is available and in good working order. Likewise, the cable operator should feel free to warn producers when their tapes are of poor technical quality, and to help them improve their production techniques. Often with
Fig. 21—A portable, half-inch videotape recorder and camera
operator assistance, a tape can be remade in a way that gets its message come through more clearly. But an operator should be very hesitant to refuse tapes solely on technical grounds unless the demand for access time is so great that material of poor technical quality should be excluded.

Charges for Production Costs

The FCC rules state that public access users cannot be charged for live studio presentation of five minutes or less. The cable operator may charge users for additional use of his facilities or for any other services provided. The NCTA guidelines recommend that "charges to users of production facilities should be limited to actual costs incurred."

Most serious community programming will run for more than five minutes. The actual costs of live studio presentations are likely to be between $25 and $50 an hour, depending on the equipment used and the production staff required. Two cameramen and a control director are the very minimum; a crew of four or more are better for all but the simplest productions. Community groups can often save money by training their own people to handle the cameras, serve as the announcer, and perform other production tasks. Studio recording on one-inch or two-inch videotape is more expensive. When tapes are edited, many production hours usually are needed for each hour of finished tape. Consequently, videotape production costs can easily mount to several hundred dollars per hour of edited tape, even with volunteer performers.

The cost of half-inch videotape production outside the studio is at least that of the tape itself. One hour of blank, half-inch videotape runs about $20 to $30 today. Tape can be reused, but the picture quality degrades after perhaps 10 to 20 replays. The basic unit costs about $1500 for the camera and videotape recorder. Half-inch tape editing equipment adds at least another $1800.

Some cable operators have charged users to replay videotapes on the public access channels, although the out-of-pocket cost to the operator should be very low. Compatibility of videotape equipment has been a problem in the past, but some industry standards have been established within the past two years. Consequently, cable operators should be encouraged to provide standard playback facilities free of charge for public access programming.

All charges to users should be clearly stated in the operating rules for the public access channel.
Funds for Public Access

Raising money will be a principal barrier to effective public access programming in most communities. Access in Canada and New York City has been supported almost entirely by government and foundation grants. The New York State Council on the Arts, the Fund for the City of New York, and the John and Mary R. Markle Foundation have been particularly active in supporting experimental video groups in New York. Unfortunately, these resources will be unavailable in most other cities.

Some local groups, such as high school theater classes, can turn to their own budgets for programming funds or raise money from film showings, bake sales, and the like. Others may be able to find a local foundation, corporation, or private donor to support their work. The local government or the public school system may have video equipment and funds for programming. Many communities, however, will look first to the closest potential source of funds—the cable operator.

Besides making studio facilities and equipment available, cable operators are often asked to finance public access programming. Community groups may ask the operator to support a particular project, or they may propose to dedicate a certain percentage of cable system revenues—over and above the franchise fee paid to the city—as a fund for access. Such proposals have been made in Berkeley and Santa Cruz, California, to name two examples.

Naturally, cable operators will resist plans to divert more of their revenues by formula to public access programming. They argue that an additional tax on cable revenues places an unfair burden on them to support programming that the community as a whole should underwrite. The FCC seems to support the cable operators on this point. Dedicating any portion of cable system revenues for community programming will require a special showing—unless this amount plus the city’s own franchise fee comes to less than 3 percent of revenues. Below the 3-percent ceiling, the city presumably can use part of its franchise fee for public access without FCC approval.

Access to Grandfathered Systems and Those Outside the Major Markets

The FCC rules require a public access channel only for new cable systems in the 100 largest television markets that were not in operation by March 31, 1972. Major market cable systems in operation before this date generally have five years to
comply with the public access requirements. As outlined in Chap. 6, however, these grandfathered systems must provide a public access channel sooner if they receive FCC certification to bring in any new broadcast signals. Public access is the FCC's first priority among nonbroadcast services.

Communities outside the major markets can require a public access channel in their franchises, but they cannot exceed the FCC's access requirements except by special showing.

Communities whose operating cable systems do not now have a public access channel must bargain with the cable operator to provide one. The negotiations may not be easy. Many cable systems with twelve or fewer channels use all of them at least part time. The operator may believe that he satisfies the community's need for access through his own cablecasting channels. He does not want to reduce his audience by providing a separate channel for public access. As one example, community groups in Santa Cruz, California asked the city council to amend its cable franchise to provide for public access. The amendments would have set up a nonprofit corporation responsible for access and dedicated 2 percent of cable system revenues for programming support. The cable operator opposed these requests and, after a debate of many months, the city council refused to approve them, contending it would amount to a breach of contract with the operator. The cable system in Santa Cruz still retains full control over local programming.

On the other hand, a coalition of minority organizations recently reached agreement with Cox Cable Communications and American Television & Communications Corporation to lease access channels for $1 a year on eight operating cable systems in California. The companies will exercise no control over the content presented on these channels.

Most cable operators endorse the public access concept and will comply with access requests, so long as they do not consider them burdensome. Some of the most innovative access projects have gone forward on grandfathered systems. When conflicts arise, however, an operator with an existing franchise has a strong bargaining position. Citizens have considerably more leverage to obtain public access commitments before a franchise is awarded than afterwards.

ORGANIZING FOR PUBLIC ACCESS

An effective public access project usually begins with one person who acts as a "sparkplug" or a small, well-motivated group that promotes the access concept to
others. Although some groups and individuals may be aware of the possibilities for creating their own programming, most will not. They must be sought out and encouraged to think of television as a tool they can use. They must be trained in use of the equipment, and in fundamental production techniques. The community will need a physical focus for public access—at the very least to serve as a clearinghouse for information and messages.

Those concerned with organizing for access have three main courses to choose from:

- Work closely with the cable operator;
- Build around a local institution;
- Use expert assistance to get started.

Where possible, community groups should use all three approaches. All are compatible with establishing a Public Access Board as well.

Working With the Cable Operator

Although community conflicts with the cable operator certainly can arise, he remains the best source of video equipment and production advice. And most operators genuinely want to help community groups with their programming. Both have a stake in making access work.

One excellent example is Reading, Pennsylvania. The Berks TV Cable Company in Reading, together with the Alternate Media Center of New York University, started a Community Video Workshop in January 1972. Phyllis Johnson, a full-time staff member from the Alternate Media Center, taught local groups and individuals how to use half-inch videotape equipment. A newspaper story and advertisements brought in the first citizen responses; thereafter interest spread by word of mouth. Ms. Johnson noted in a progress report what kind of people became involved:

Most of the people who came in response to the story were not the disenfranchised, or social militants looking for a forum. Mainly they were private individuals looking for a means of self expression, or representatives of Reading’s many non-profit organizations desirous of publicity. They were people who felt that there was much to be said about Reading that the media had not been saying.
After six weeks the cable system hired a local workshop member to serve as full-time coordinator, allowing Ms. Johnson to phase out her activities. Two weeks later the first hour of community produced tapes was shown on the cable system. A local newspaper advertisement, reproduced as Fig. 22, promoted subscriber interest.

Reading's cable system has been in operation for 8 years and therefore was not legally required to provide a public access channel until 1977 under the FCC rules. The cable operator nonetheless took the initiative in seeking people out, training them, providing them with equipment, and presenting their programming—uncensored—on his system. Reading's success with public access provides a good model for other communities to follow.

Building Around a Local Institution

Since the startup problems are the most difficult, developing public access around an existing institution may be a useful approach for many communities. A community college or university, a local church, or the YMCA may offer a place to store video equipment, hold meetings, and maintain a telephone message center. A local organization already familiar with video production such as a public television station can, of course, do much more.

In Port Washington, New York, the public library serves as the access center. With a starting grant from the New York State Council on the Arts, the Port Washington library purchased videotape equipment for community use. The library Video Center trains local residents to use the equipment, after which they may check it out to do their own taping. In the Center's first year of operation, 450 people learned how to make their own videotapes. About 200 hours of edited tapes were preserved, covering local issues such as youth and drugs, city planning, and the needs of the elderly, as well as such lighter fare as the Rotary Club's annual pancake eating contest.

Interestingly, Port Washington has no cable system. The community-produced tapes are kept as part of the library collection, available to borrowers for playback on videotape recorders. The project's objectives are to involve citizens in local problem-solving, and to develop a sense of community through sharing ideas and opinions on videotape. However, the Port Washington approach obviously could be used to develop public access programming for replay on a cable channel.
We're ready for you to watch:

Video Tapestry

produced by

the new

Community Video Workshop

Reading citizens are creating and producing their own programs for cable television with the camera that goes with the people, where the story is.

See it on Cable Channel 5
Repeated 3 times for viewing convenience

Wednesday
1:00 – 2:00 p.m.  10:30 – 11:30 a.m.
9:00 – 10:00 p.m.  3:00 – 4:00 p.m.

This week:

RED LIGHT OR RED TAPE:
human stories on the scene, of how the fear of traffic affects the lives of residents of Schuylkill Ave. and Ave. A.

ONE SUICIDE A WEEK:
a discussion of suicide in Berks County and the HELP emergency telephone service, videotaped right in the living room of a Reading citizen.

It could be your story —
New classes are forming. If you would like to join this free workshop, two lessons will start you off.
Call 376-6341

BERKS & SUBURBAN Cable Co.'s.

Fig. 22—An example of public access programming
Using Outside Assistance

New York City's energetic efforts in public access would be impossible without the availability of people trained in video techniques to help community groups and individual citizens get started. These "facilitator groups" include the Alternate Media Center at New York University, Open Channel, and other local video groups. Each group has its distinct school of thought about videotape production, but each helps other groups and individuals make their own programming.

New York City facilitator groups are unique in their access to foundation and state grants to support their work. Still, informal video groups have sprung up in most university towns and major U.S. cities. If funds are available, facilitators can be hired to train community groups in the use of video. A facilitator's fee generally runs from $25 to $100 a day, although some individuals supported from foundation grants or other sources may give their services free of charge.

Sometimes the cable operator will hire a facilitator group to begin public access programming, as was done in Reading. In other communities the school system, a local community college, or a church group can raise the necessary funds. Providing travel expenses for a video group to come to the community and present examples of its programming may be a good way to begin. Communities should be warned, however, that some video enthusiasts are more interested in the techniques themselves than in using them to communicate ideas to other people. They may want to train disciples rather than help community groups use video to achieve their own objectives. Consequently, local groups should rely on personal recommendations based on past performance before investing much time and money in bringing facilitators to the community.

BUILDING AN AUDIENCE

If it is to provide more than mere catharsis, public access must attract audiences as well as programmers. Of course, just as access programming need not mimic broadcast television production, its success need not be measured by audience ratings. Even so, producers want their programs to be seen and to have some impact in the community.

Building an audience for public access calls for both program promotion and audience feedback. Obviously, few viewers will see a particular access program if
they do not know when it is to be shown. The cable operator can be the principal promoter of public access by including program schedules and promotional material with his monthly billing to subscribers. A program schedule displayed on the access channel every half hour also will help. Moreover, he can present this information on other cable channels, perhaps by messages displayed on an automated service channel. All these promotional methods are recommended to cable operators in the NCTA guidelines.

A Public Access Board or other coordinating group can furnish program schedules to local newspapers and make public service announcements on local radio and broadcast television stations. Posters and promotional flyers can be prepared. Finally, programming groups will want to advertise their efforts to their own memberships by means of direct mailings, phone calls, and announcements at meetings. In promoting public access, community groups will find that funds spent to attract and hold an audience are as necessary as funds to improve production quality.

Feedback from viewers is also important. Viewer surveys are expensive, especially ones that will measure the small audiences generally expected for public access programs. However, a questionnaire could be sent to cable subscribers asking whether they watched the public access channel and, if so, which programs they liked best.

One Canadian cable system compiled a list of more than 100 tapes that had been produced by local community groups. It sent the list to cable subscribers, asking those interested to phone in and say which tapes they would like shown. More than 1500 telephone requests were received within four days. The cable system then played back every tape that had been requested, with the most popular ones shown several times at prime-time hours. The schedule of showings was displayed each day on the access channel, much like the schedule for a film festival. Thus, the cable system both promoted public access programming and obtained feedback on audience interest in particular tapes. A questionnaire to subscribers after the showings would be a logical next step.

* * * * *

Despite the impressive New York and Canadian beginnings, public access today is largely untried and uncharted. It is certainly unfunded. At first, access programming is likely to affect the programmers and their organizations more than the audience. Video is a powerful tool for seeing oneself, as well as a means of self-expression.
The success of public access should not be measured by the number of hours of programming the community can produce. Rather, the end purpose of access is to further the objectives of individuals and groups who use it by influencing those who watch it. Experience in the next few years will determine whether public access will be a vital force in exchanging ideas and opinions throughout a community, or merely an outlet for a few individuals to vent their feelings on an unwatched channel.

SUMMARY CHECKLIST

- If the community is outside the major markets, will it specify public access requirements in its franchise?

- If the community now has an operating cable system, will public access arrangements be negotiated with the operator?

- Do the local rules for public access meet FCC requirements? Do they also provide for
  — regular scheduling of some access programs?
  — use of production facilities and equipment?
  — stated charges for any production costs levied on users?

- Has the community considered delegating responsibility for public access to a Public Access Board or other community entity? (If it does so, a special showing to the FCC will be necessary.)

- How will the community organize to make best use of public access? Who will train community groups and individuals in the use of video? Can those interested in public access
  — work closely with the cable operator?
  — build around a local institution?
  — use expert assistance to get started?

- How will funds be raised to support access programming? Has the community considered using part of its franchise fee for this purpose? (This also may require a special showing to the FCC.)

- How will access programs be promoted to attract an audience? How will access groups get feedback from viewers?
Recognizing the potential importance of public services on cable, the FCC has mandated one cable channel for education and one for local government access in the major markets. The cable operator is to furnish these channels free of charge on an experimental basis for at least five years. Communities outside the major markets also may require these access channels in their franchises.

As with public access, however, simply making channels available by no means guarantees that they will be used well or even used at all. The FCC rules do not require the operator to provide programming facilities or funds to support education and local government applications. And few school systems or local government agencies today have the resources and the experience to begin using these channels immediately. Without public action to fill this void, public services on cable could amount to little more than reruns of educational and government produced films. Consequently, even though little is known about the value of television as a non-entertainment vehicle, communities should start drawing their plans to use the education and government access channels early in the decisionmaking process.

This chapter describes some potential public service applications. It also outlines the issues a community must face if it is to go beyond mere superficial uses of cable. It is worth emphasizing again that cable television is only one of several means to provide entertainment, information, and services to people.

\[1\] Much of the information in this chapter is discussed more fully in two companion reports: Polly Carpenter, Cable Television: Uses in Education, The Rand Corporation, R-1143-NSF; and Robert K. Yin, Cable Television: Applications for Municipal Services, R-1140-NSF.
television, the telephone, and the mails may be superior to cable for many applications. The community will therefore be wise to concentrate on the public services that cable makes possible, and avoid being overly beguiled with cable's interesting technology.

In carrying television programming and other services to people, cable does offer three principal advantages over other communications links. It can provide (1) large channel capacity, (2) private channels as a means for audience selection, and (3) eventual two-way interaction between viewers and the programming source. The chief drawbacks are that unless more fundamental restructuring of educational and government institutions can take place, public services on cable will require additional expenditures, and generally will not lead to dramatic improvements in services. A third problem, especially for municipal services, is that the target audiences often will not be cable subscribers.

The long-term potential for education and municipal services on cable, however, is very promising. The most important reason to experiment now is to assure that public uses are not foreclosed by a rapid development of entertainment and other commercial services. The FCC has dedicated two access channels experimentally for five years only. If few useful applications have evolved by 1977, the Commission may see little need to retain these channels, much less to reserve more of the cable spectrum for education and municipal services. Consequently, civic leaders, educators, and local officials should take seriously their mandate to develop applications for the access channels in the next five years.

EXAMPLES OF EDUCATION AND GOVERNMENT USES

Many present-day examples of education and government uses of cable television can be cited. These are some typical applications:

- The Willingboro Township public schools in Willingboro, New Jersey, use cable television to transmit reading readiness programs for preschoolers under a federally funded program. The programs are seen in nursery schools, at the public library, and in children's homes.
- Oregon State University in Corvallis, Oregon, televises college-credit courses to students off-campus via cable.
- The cable television system in Monroe, Louisiana, connects with the Loui-
siana Hospital Television Network to distribute continuing medical educa-
tion directly to doctors' homes and offices on a special channel.

- The police chief in Liberal, Kansas, uses an "Emergency Alert" cable channel to report tornado warnings, lost children, and other emergencies. A tone generator on other channels notifies viewers when an announce-
ment will be made.

- The cable system in Palm Desert, California, produces programs for Chicano migrant farm workers on maternal and child health care, job opportunities, social security, welfare, and other government services available to them.

- The public library in Casper, Wyoming, provides a "Video Reference Service" to the community on cable television. Subscribers phone in questions, and a librarian answers them via a cable channel.

- The Colorado State Department of Employment presents a program on local job opportunities over the Colorado Springs cable system.

- Sunnyvale, California, produces training videotapes for new city em-
ployees using the cable system's studio facilities.

ORGANIZING TO USE THE ACCESS CHANNELS

In their initial planning for education and municipal uses of cable, local officials, educators, and citizen groups should consider several issues. These include:

- Administering the access channels
- Wiring schools and government facilities
- Sharing production facilities and equipment
- Using or leasing additional channels
- Obtaining funds for programming and service development
- Involving the audience

Administering the Access Channels

The FCC regulations make the cable system operator responsible for adminis-
tering the education access channel "for use by local educational authorities." His rules for the channel must be approved by the FCC at the time of certification and
must prohibit commercials, advertising for political candidates, lotteries, and obscene or indecent material. But the FCC does not indicate who qualifies as an educational authority or how priorities should be set among competing users. For example, how should morning "prime time" be divided between the local elementary schools and a community college? Should private and parochial schools receive as much time as the public schools, or any time at all? Can a "Committee for Better Schools" get television time to challenge the school board's busing policy? Is it entitled to use the education channel, or are its needs satisfied by time on the public access channel?

These are heavy questions for a commercial cable operator to decide. Further, local officials cannot intervene, since the FCC rules clearly state:

Except on specific authorization, or with respect to the operation of the local government access channel, no local entity shall prescribe any other rules concerning the number or manner of operation of access channels.

If the community is prepared to make a special showing to the FCC, however, it can prescribe rules for administration of the education access channel in its franchise. For example, the franchise might establish an Education Access Board, similar to the Public Access Board described in Chap. 8, to set policy for the use of the education channel. This Board should not be dominated by public school authorities or any other single educational body. It might include elected school board officials, public school teachers and administrators, private school, community college, and university representatives, and private citizens unaffiliated with any educational group. The cable operator could then administer the rules for access set by the Board.

The local government has clear authority to administer use of the government access channel. Even here some ambiguity might arise as to which local government has authority, however, if there are overlapping jurisdictions, or if a franchise covers more than one municipality. As noted in Chap. 6, a single government channel may suffice when a cable system covers two or more communities. Presumably, the franchising authority or an intergovernmental administrative group would control the local government channel. The franchising authority may want to set up an interagency committee, perhaps including individuals outside of local government, to advise it on channel usage.

In fact, the community can consider establishing a single Board to administer all three access channels. This might help allocation problems when there is heavy demand for only one channel. For example, the education channel might be overloaded with requests for the daytime hours while the public access channel is nearly
empty. The reverse might be true at night. A single Access Board could pool time from the two channels to give access to more users. This, too, would require a special showing, since the FCC rules presently allow the cable operator to lease unused time on any access channel as he sees fit.

Wiring Schools and Government Facilities

Although much of the programming on the education and government channels may be designed for home viewers, many applications will be aimed at classroom and municipal agency audiences. The franchising authority will want to insure that schools, municipal offices, and other community facilities are wired to the cable system expeditiously and at reasonable cost. Several issues may be involved. The cable trunk lines installed to serve residential customers may not pass close to downtown office buildings. In that case, the community might find that cablecasting city council meetings would be too expensive or would be delayed for several years until that portion of the city were wired. Drawing up a construction plan to meet all of the community's needs is thus part of the overall franchising process.

The franchising authority also will want to establish reasonable installation and monthly rates for schools and local government facilities. In the past, many cable operators have offered to wire schools, hospitals, and city offices free of charge as part of their franchise bid. However, the FCC rules prohibit free installation and service where it would be a financial burden on the operator, as discussed in Chap. 6. Nevertheless, the city can establish preferential rates that are not burdensome, or justify its position to the FCC in a special showing.

Finally, the franchise might contain provisions for internal wiring of schools and governmental facilities. Many recently built schools have master antenna systems for television reception in each classroom. Installing cable in other existing buildings can be expensive, however. The city may want the cable system operator to install such wiring at cost or at a negotiated price. This might also include installation of special wiring and facilities for cablecasting in the city council chambers, public meeting rooms, and school auditoriums.

Sharing Production Facilities and Equipment

One of the more serious barriers to effective use of the education and local government channels may be the lack of facilities, equipment, and trained produc-
tion personnel for program origination. Some school systems, universities, and municipal agencies may already be involved in video production, but most probably will not. For these latter groups, the best advice is to share facilities with someone else. The possibilities include:

- Using the cable operator's studio and equipment.
- Using existing school or institutional facilities.
- Forming a new consortium of education or government groups.

Using the cable operator's studio and equipment will require negotiation. The operator must provide production facilities for short public access messages, but he is under no such obligation with respect to the education or government channels. Still, cable operators want to encourage new applications, and they will generally be receptive to aiding school and government users. The charge for using the facilities should be worked out in advance.

Sharing facilities and equipment with a present video user may be another solution. For example, many universities now have video production studios for their own instructional purposes. A university then might help a police department to produce in-service training tapes for showing on the local government channel. Again, any payment for use would have to be negotiated in each local situation.

A third approach is to establish a consortium of users to purchase equipment jointly and hire a central production staff. For example, the Educational Television Association of Metropolitan Cleveland (ETAMC) serves 53 public and private school systems. At present, ETAMC operates five ITFS television channels (a special frequency band allocated for education), with programming facilities and a sizable staff. Five cities in Orange County, California, have established a public Cable Television Authority to develop educational uses of cable on a regional basis. Even without a formal Authority, school districts or government users could agree to share video production facilities and hire a common staff.

In addition, educators and local government officials should consider the advantages of reaching a wider audience through interconnection of cable systems. For example, cablecasting of county zoning board hearings, or discussions about regional land use and development patterns, will be most effective if shown simultaneously on cable systems in many communities. Or a community college may want to provide adult extension classes throughout a metropolitan area. Planning for these kinds of applications will require consideration of cable system interconnection at an early stage, as discussed in Chap. 5.
Using or Leasing Additional Channels

Many education and municipal applications clearly will require more than a single access channel. The intensive use of television for classroom instruction in elementary and secondary schools, for example, could easily occupy ten or more channels in the morning and early afternoon. Noting these possibilities, some education and public interest groups have recommended that more than three access channels be reserved for public purposes.

The FCC rules do not permit franchises to require more access channels without a special showing. However, the rules not only permit but require cable systems to make additional channels available on a leased basis. A school system that wished to use four television channels for classroom instruction could therefore lease them from the cable operator. Channel leasing charges would be negotiated among the cable operator, the user, and the community’s franchising authority. Preferential rates for noncommercial uses evidently can be permitted, so long as they do not burden the cable operator or discriminate unfairly against other potential users. Preferential rates would not be a burden to the cable operator as long as all users pay more than the operator’s marginal cost of providing a leased channel. One approach would be to set multi-part rates, one part of which would be proportional to the revenue that the lessee receives from channel use. An educational user who gains no revenue from the leased channel might pay a base price of, say, $30 an hour, while a pay-TV promoter might pay more than $100 an hour.

The community also should consider a special showing to the FCC if it can justify a need for additional access channels or for reallocation of time among the three presently required. For example, the community might want free use of the public access channel in the morning for classroom instruction, and use of the education channel in the evening for public access. Writing this into the franchise would require a special showing before the FCC. So, too, would a requirement for a second education channel.

Obtaining Funds for Programming and Service Development

As with the public access channel, it will cost money to use the education or government channels effectively. Programming of the simplest sort—televising a school board meeting, for example—will cost $25 to $100 an hour, and more elaborate programming will cost considerably more. New York City budgets more than $500,000 a year for operation of its over-the-air municipal channel. Most cities will
not be able to approach this figure, to be sure, but even 20 hours of programming a week, at $100 an hour, would cost $100,000 annually.

There are no ready answers to the question of how educational groups or local governments should go about raising funds for local cablecasting. Any levy on cable system revenues beyond that needed for the local regulatory program will require a special showing. Some federal, state, and foundation assistance may be available, especially for experimental purposes, but communities eventually will have to look to their own education and municipal budgets for programming support. Recognizing this at the beginning is critical to the development of sensible plans for programming the education and local government channels.

Involving the Audience

For public services to be worthy of the name, audiences must be encouraged to react to and participate in the programming they watch. At first, this may mean requesting parents to call in questions about reading problems to school officials in a cablecasting studio, or asking for postcard opinions on a proposed local ordinance. Eventually, two-way cable systems will permit subscribers to respond directly to instructional programming, or on local issues. But since two-way systems probably will not be widely available for another decade, communities should plan to use the telephone, the mails, or other feedback mechanisms in the interim.

Program promotion to build an audience is as important for the education and government channels as it is for public access. The same promotional methods described in Chap. 8 can be employed here. A questionnaire sent to subscribers in their monthly billing statements also can increase the value of instructional and other public service programming. Those experimenting with local access programming today have little idea of who, if anyone, is watching. And the few subscriber surveys conducted to date show very small audiences for local programming. In large part, this is because established viewing habits are not easily altered and because local cablecasting has been less interesting to viewers than what has been available on other channels. Viewing patterns may change as more subscribers become aware of the new fare available to them on the education, government, and public access channels. But producers of programming for access channels should sample their viewing audience often, so that their products can satisfy real community needs and interests.
EDUCATION ON THE CABLE

Of all public services, educational uses of cable television have received the greatest attention. The tremendous range of potential educational applications is discussed in a companion report\(^2\) and in other references listed below. This Handbook can only outline some of the educational uses of cable that seem most important.

In-School Instruction

More than half of the nation's public elementary and secondary schools use instructional television today. Most receive educational programs off the air from local VHF and UHF broadcast stations; according to a recent survey, however, nearly ten percent use the special ITFS frequencies allocated for instructional television or other closed-circuit systems. Many private schools also employ instructional television in their curricula.

Cable television can supplement or supplant other means of television transmission. In new applications, cable television distribution to schools often will be cheaper than building a separate ITFS system. Even where existing broadcast or ITFS facilities are available, the cable system offers additional channels that can alleviate program scheduling problems.

Whether distributed by cable or by other means, instructional television is most successful when it is fully integrated into the school curriculum—as in Anaheim, California, and Hagerstown, Maryland, for example. Most other school systems use television to provide supplementary instruction and to present materials not readily available in the classroom.

Out-of-School Education

Although classroom instruction probably will account for most educational uses of cable television, the most exciting new applications involve learning outside the school. These applications span the years from preschool to retirement—indeed, the most significant educational opportunities are for students not considered to be of school age.

\(^2\) Carpenter, op. cit.
Career Education. Examples include courses televised in the home for mothers with small children, or continuing education classes for physicians in their offices. A course in automotive electronics could be presented to auto mechanics on the job or after hours at home. Similarly, teachers could update their training through televised classes at home or at school.

All these examples would utilize cable's available channel capacity and its ability to carry programs directly to the home or job location. The ability to select audiences with special converters or decoders, perhaps for a series on open heart surgery for nurses, also may be useful. Cable's two-way capability offers additional exciting possibilities, but interactive educational programming is still in the early experimental stages.

High School and Post-Secondary Degree Courses in the Home. A sizable home audience evidently exists for university extension classes, high school equivalency courses, and other courses leading to academic degrees. Although schools such as the Chicago Junior Colleges have used television for many years, the dramatic success of the British Open University has generated new enthusiasm for televised degree courses within the United States. Germany, Japan, and Poland also operate successful post-secondary degree programs on television.

These present examples all use over-the-air broadcast television, but cable again offers more channel capacity for better scheduling and an ability to select audiences. Several major universities now are considering offering extension classes via cable. Community colleges may be able to attract even wider audiences for degree programs.

Some degree programs may be encoded and shown to a limited audience on a pay-TV basis, although not on the free education access channel. However, a college could present classes on the free education channel and charge tuition to those who wanted course credit. All told, the use of cable television for high school equivalency and post-secondary degree programs should bring us considerably beyond the "Sunrise Semester" limitations of broadcast television.

Instruction for Homebound and Institutionalized Persons. One of the most interesting demonstrations of cable's potential began in Overland Park, Kansas, in 1971. Two homebound, handicapped children "went to school" by means of two-way video links between their homes and classrooms. Although widespread use of two-way video is not likely to be economically feasible for many years (the Overland Park experiment was for demonstration purposes only), many communities may be able to program one-way cable channels for home instruction to the sick or handicapped. State or federal aid may also be available for this purpose.
Instructional television for prisoners, mental patients, and other institutionalized people could also be an important application. Many institutions already have closed-circuit television systems, but the use of cable to distribute programming from a central source or to share programs among several institutions may prove important in some cases.

Preschool Education. Communities can use the education channel to teach preschool children in their homes or in childcare centers. "Sesame Street" is the obvious prototype. Communities may want to originate their own programming for preschool education, or carry "Sesame Street" and other purchased programs on the education access channel.

"Sesame Street" often is broadcast on a UHF broadcast channel. The Children's Television Workshop, creator of "Sesame Street," has found that many children in low-income areas do not see the program because their television sets do not receive UHF stations well. Although cable television solves the UHF reception problem, low-income families may be the least likely to subscribe to cable and thus to benefit from the education access channel. For preschoolers, this handicap might be helped by subsidizing cable drops to childcare centers and nursery schools.

General Education. Cable television may affect education most by separating learning from the rigidity of classroom instruction and formal degrees. People learn from television today, of course, as our experience with programs such as "Sesame Street," "Civilisation," and the Jacques Cousteau series testifies. Cable television offers the possibility of many more varieties of such "educative" as opposed to "instructional" programming. Unfortunately, the questions of creating and financing the programming are still largely unanswered.

Two specific examples of nondegree educational programming that may be of direct community benefit are English as a second language and career counseling. Again, these programs are likely to be most important in low-income or minority areas, where cable penetration may be least. Here, the community could provide cable connections to a community learning center in a storefront or shared neighborhood facility for group viewing and discussion.

School-Related Programming. Evening programming on the education access channel might bring parents closer to the schools. As the former school superintendent in Willingboro, New Jersey, points out:

Educators have come to recognize that informed parents and taxpayers are likely to be more understanding and supportive of the school's efforts, and
that parent involvement during (and even as a forerunner to) the formal teaching process is highly desirable.3

The Willingboro public schools have taped student music and dance performances, student and teacher interviews, and special classes for evening showing to parents over the community's cable system.

The education access channel also could be used to inform the community about school issues. Televising school board meetings in their entirety would be one example. A few cable systems and public broadcast stations now do this, with considerable interest and response from their communities.

Where communities have formed citizen advisory committees or other school-related citizen groups, their meetings, too, might be televised. Arguments for and against a new school bond issue could be presented. Although political advertising on the education channel is prohibited by the FCC, discussions among school board candidates would seem an appropriate use of access time.

* * * * *

All of the above applications can be implemented on the single, free education access channel, or on additional leased channels. All presumably could profit from cable's two-way capability when it becomes available, but none are utterly dependent on it. Where direct response is important, as perhaps for home instruction to the handicapped, the telephone may substitute for a two-way cable link. Consequently, communities should not assume or wait for cable's two-way capabilities before making plans for the education access channel.

However, use of the education channel will cost money. The chief costs will be for planning, producing the programming, distributing related materials, and working with students and other viewers. These costs directly reflect the need to satisfy four criteria essential to any successful use of television for education:

* The educational television program is planned for a specific target audience.

* The programming emphasizes professional television production techniques, using both subject and media specialists. This is in sharp contrast to the stand-up lecture or "talking face" all too common in instructional television.

• The television programming is only part of a larger educational program that is likely to include reading materials and direct face-to-face interaction between students and teachers.

• Direct student feedback and program evaluation are built into the educational program from the beginning.

These criteria show that the sponsoring educational institution plays the crucial part in a successful application of cable television; the cable system itself has only a supporting role.

In nearly every case, the funds needed for educational programming on cable will be over and above those now spent on education within the community. Few educational authorities today would be able to substitute television for classroom teachers even if it proved cost-effective to do so. Citizens therefore should not assume that the use of cable television for education will save money for the schools. Rather, cable television may provide new opportunities for learning to more people, and often at a lower cost than other instructional methods.

MUNICIPAL SERVICES ON CABLE

The list of potential uses for the local government channel is at least as long as that for the education channel. The list includes applications for:

• Law enforcement
• Fire prevention
• Emergency services
• Criminal justice administration
• Employment services
• Consumer protection
• Environmental monitoring and control
• Traffic monitoring and control
• Health care
• Public library services
• Social services
• Municipal cultural and recreational events
• Local government administration
• Community involvement in local issues

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Many of the applications require technical features that are not common in cable systems today, such as a "frame stopping" terminal for viewing a computer-selected job listing on the television screen. The need for costly devices of this kind, and for the even more expensive software to make them operate, will make providing these services directly to the home impracticable in the next decade. Yet the same service may be economically feasible in an employment office or a neighborhood service center. This section outlines municipal applications that seem ready for early implementation in either the home or a group-viewing environment.

Televising Local Government Activities

An obvious use of the local government access channel is to cover city council meetings and other important government activities. Meetings can be televised in their entirety, rather than condensed into a few minutes of action for a local news program. Although most public meetings admittedly will be less than fascinating to most viewers, a principal objective of government access can be to show how local government bodies really function in their public meetings. This will stand in sharp contrast to the television viewer’s usual perception of public affairs as a series of two-minute news segments.

Some cable systems already carry city council meetings on their local origination channels. Where they do not, the city might contract with the cable operator to televise them on the government access channel. The cost is likely to be the same as that for other local origination—probably between $25 and $100 an hour.

Coverage can extend to zoning board hearings, planning commission meetings, and other open sessions. Many local government meetings are legally required to be open to the public, but few citizens bother to attend them. Cablecasting such meetings would both make it easier for interested individuals to see them, and give other citizens some knowledge of what goes on in local government even if they did not view the meetings in their entirety. Audience rating should not be the primary criterion for programming the government access channel.

Meetings of neighborhood councils and other nongovernmental groups also might be televised. Even court sessions could be shown if local laws and judges permit. Coverage also could include discussions on local issues with government officials and community group leaders. As with today’s "talk shows," citizens could phone in questions or comments on the issues. Use of the cable system itself for viewer feedback on local issues will eventually be possible with development of two-way interactive home terminals.
In-Service Training

In-service training of policemen, firemen, and other municipal employees makes up a large percentage of local programming on WNYC-TV, New York City's over-the-air municipal channel. New York is today the only city government that operates its own television station, but the government access channel will provide a similar opportunity to all major market communities with cable systems.

A city can purchase some in-service training films and tapes from other cities, through professional organizations such as the International Association of Chiefs of Police, or from commercial sources. Local programs might be produced by using the cable operator's studio facilities under contract with the city. If funds are available, however, the city may prefer to buy its own equipment and hire a video production staff. The training budget might also include the monthly cable charge for city employees who would not otherwise subscribe.

Although private channels could be assured by providing a special converter or decoder at each employee's home, privacy may not be required for most in-service training programs. In fact, widespread citizen knowledge of police training programs might help improve police-community relations.

As with all educational programs, the use of cable television for in-service training will be most successful when it is integrated with other media and includes direct student-student and student-teacher contacts.

Community Information Programming

Possibilities abound for the use of the government access channel and additional leased channels to present information on community events, library services, health care, drug abuse, social services, employment opportunities, and other government services. The problem is that most such programming available today is deadly dull. Viewers, particularly those whom planners want the information to benefit, are likely to flip quickly past the government channel to their favorite situation comedy (as will the planners).

A local government can increase viewer interest in its channel through improved programming, of course, but this costs money. The cheapest programming is that available free from federal agencies and commercial sources. Telephone companies, for example, produce a wide variety of "public interest" films on safety and other subjects that could be shown on the government access channel. Still, some local programs can be produced inexpensively and draw considerable interest.
if done well—as, for example, a show that gives consumer information on local supermarket prices. The principal success of Casper, Wyoming’s Library Reference Service on cable has been to bring more people to the library to use reference materials and borrow books. Local personalities may also draw interest to the government channel. Finally, the city can use commercial broadcasting’s technique of sandwiching important but unexciting programs between two popular segments. A program on preventive health care may have far more impact if shown immediately before or after a debate on sex education in the public schools.

The problem of cable’s penetration being smaller than that of off-the-air television is particularly acute for community information programming. Unemployed persons presumably would profit most from job information displayed on the government access channel, but are unlikely to be cable subscribers. Bringing cable to the unemployed would require additional subsidy from the city.

Community Information Centers

The most exciting municipal applications require expensive additional equipment and even more expensive development of programming and computer-aided information bases. Examples include remote medical diagnosis, individual requests for social service information, or reading a book from a central library on the television screen.

Although many enthusiasts have proposed these as cable services to the home, they probably will be too expensive for all but the richest families for at least a decade. Yet some services may be feasible if costs are shared among many users. Consequently, these applications will be developed first for use in schools, hospitals, and other institutions—not in the home.

However, cities can experiment with “community information centers” that provide televised information and more sophisticated, municipal services directly to citizens. These might be physically combined in a storefront or neighborhood facility with the learning centers outlined above. Public libraries would also make excellent locations for expanded community information services.

Suggestions for community information centers often call for multiple two-way video links, computerized information sources, and costly interactive terminal

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A proposal to establish community information centers is contained in the report of the Committee on Telecommunications, National Academy of Engineering, Communications Technology for Urban Improvement, June 1971.
equipment. But interacting with people at the community center seems at least as important as interacting with a distant computer. For example, a city could begin by targeting some programming on the government access channel toward groups assembled at existing neighborhood facilities. Expectant mothers might be directed to a community health center to watch a program on prenatal care. Doctors and aides could then respond to the mothers' questions, or phone in questions to the originating studio for discussion on the government channel. Even when interactive television terminals become available, testing them in community centers will be less costly and the results perhaps more effective than installing them in individual homes.

Municipal Closed-Circuit Applications

Other important municipal applications will demand much more capacity than the single government access channel, particularly if two-way video communications are contemplated. Video surveillance systems, medical consultation among hospitals, and video conferencing among municipal agencies are three examples of closed-circuit applications. A relatively small number of points would be linked for these services, which would not be available to residential subscribers.

In general, designing the system, purchasing terminal equipment, and developing the necessary software will be expensive, even if the channels are free. In practice, of course, additional cable channels must be leased or a separate cable installed for closed-circuit applications. Consequently, these applications are probably beyond the budget of most local governments today. Some federal and foundation grants for demonstration projects may be available in the next few years, however, as well as federal revenue sharing funds. Cities therefore should work closely with their federal liaison officials in planning for possible closed-circuit uses. Cities should also consider how the cable system can be designed to accommodate these uses when they become feasible in later years.6

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6 A recent study recommended that four separate cable systems be installed for government, business, and institutional services in Washington, D.C. The initial cost is estimated at $2.3 million for the four transmission facilities alone. The cost would be much higher if the closed-circuit system were not installed at the same time a subscriber-based cable television system were built for Washington. See W. F. Mason, et al., Urban Cable Systems, The MITRE Corporation, M72-67, May 1972.

6 For further discussion see Filnik, op cit.
Problems of Implementing Public Services on Cable

Although a variety of public services are potentially feasible on cable, a number of barriers stand in the way of their successful implementation:*

1. *Almost all of the new applications will require additional local expenditures, particularly for programming.* Few, if any, will yield long-term savings; but, as in education, cable television can improve the quality of information and services available to citizens.

2. *Many applications will not dramatically improve municipal services.* They may improve communications between municipal officials and citizens, and make public services more accessible, but improving the services themselves is more difficult.

3. *To be effective, municipal information and services must reach people who may be difficult to reach by cable television.* Low-income families in particular may not subscribe to cable without subsidy.

4. *Most proposed new applications have not been tested.* Assessing their effect on television viewers may also be difficult.

5. *Some of the most useful cable television applications depend on the development of two-way interactive services.* Though some demonstrations are now under way, two-way services are not likely to be widely available in cable systems for at least a decade.

6. *Many services can be carried better or more cheaply on other communications media.* Over-the-air broadcasting, the telephone network, and the mails will prove formidable competitors to cable for many urban applications.

7. *The use of cable television for municipal services will raise controversial social issues.* Privacy questions raised by video surveillance systems are a prime example.

8. *The use of cable television for municipal services inevitably will produce unforeseen secondary consequences.* This will be as true for cable as it has been for other new technologies such as the automobile and the telephone.

* These eight points are taken directly from Yin, op. cit.
PLANNING FOR PUBLIC SERVICES ON CABLE

Given all these caveats, how can local officials, educators, and citizens best use the education and local government access channels? First, study groups should be established early in the planning phase, as recommended in Chap. 5. These groups should use published information, the experience of other communities, and expert advice to assess the community’s needs and priorities. They should estimate the funds available from local budgets, state aid, federal grants, and private and foundation sources. They may want to subject each proposed application to a list of questions like the following:

*Checklist for Public Services on Cable*

1. What is being done now?
   — who provides the information or service?
   — who uses it?
   — how is it delivered to users?
   — is there feedback from users?
   — how much is spent on service delivery and feedback?
2. What are the present problems in providing the service?
3. How might cable television help? Would other media, such as broadcast television, ITFS channels, the telephone, or the mails be as effective?
4. Can the service be provided on the free education or government access channels?
5. Will it require other facilities or equipment?
   — additional channels?
   — private channels?
   — two-way response (data, audio, or video) from viewers?
   — viewer-to-viewer communications?
   How much will this cost?
6. Who will do the programming or provide the service? How much will it cost?
7. How will the target audience be identified and reached? How much will this cost?
8. What are the arrangements for audience feedback?
   — how will success or failure be measured?
   — how will feedback modify the way the service is provided?
   How much will it cost?
9. Overall, how will the cable television portion be paid for?
   — from existing local budgets, as a result of cost savings?
   — from additions to local budgets?
   — from state or federal aid?
   — from foundations or private gifts?
   — by taxing cable subscribers?

10. Will a special showing to the FCC be necessary? Must any local, state, or federal laws or regulations be changed?

11. What will be the effect on existing local institutions that now provide the service? Must new institutions be created?

12. What specific steps must be taken to implement the service on cable television?

Answering these questions will help distinguish among feasible and infeasible applications, and those that are worth trying experimentally. Only by active experimentation in the next few years will the potential of cable television for providing public services be understood and eventually realized.

SUMMARY CHECKLIST

- If the community is not in a major market, will its franchise require free use of an education and a government access channel?

- Has the franchising authority designated planning groups to recommend how to use the education and government channels?

- Has the franchising authority or planning group considered
  — whether to set rules for administering the education channel, supported by a special showing to the FCC?
  — how the government channel will be administered?
  — what construction schedule and rates are appropriate for wiring schools and other public facilities?
  — what production facilities and equipment can be used?
  — what rates for noncommercial use of additional leased channels will be set?
— where funds for programming and service development will be obtained?
— how audiences will be made aware of, and participate in, public services on cable?

- What specific educational and municipal applications have been proposed? Have questions like those listed on page 170f. been asked for each potential program or service? Which seem most feasible?

- Has the cable system been designed to accommodate other public services at a later date?

- What are the prospects for demonstrating new educational or municipal applications on the community’s cable system?
Chapter 10
LOOKING TO THE FUTURE

Once in place, communication systems are not quickly changed. A 15-year franchise awarded in 1973 will not expire until 1988. This year's engineering design will determine what mix of cable services can be offered in 1980. And the technology for the new services of the 1980's is already on the drawing boards: electronic mail delivery to the home, dial-up libraries of vocational and college classes, a direct link to the hospital for medical emergencies, and the like.

Many of the short-term decisions to be made will have lasting effects, and communities should devote to them all the wisdom they can muster. But several longer-range issues are sure to arise as cable becomes a part of American life: we should start thinking about them now. These include questions of privacy, regional and national interconnection, common carrier status for cable, and the long-range impact of expanded cable communications on individuals and society.

PRIVACY

Cable's direct link to the home raises several issues of privacy. Today, some police departments are considering using cable for video surveillance of streets and other public areas. Much more troubling is potential home video surveillance when two-way cable systems become widespread. The Orwellian 1984 specter of people not watching, but being watched by television in their homes via cable is understandably distressing. Even a recent proposal to place a government-operated radio receiver
in every home for emergency warning was denounced on all sides as a possible first step toward mass surveillance.

Of more immediate concern than home video surveillance is the possibility of "cabletapping" messages carried to and from subscribers. Cable will not replace the telephone for voice conversations, but two-way services may make available a wealth of data on subscriber viewing habits, buying patterns, and political preferences. The problems of clandestine access to these data resemble today's problems with telephone wiretapping and misuse of credit information.

Some people are particularly concerned about eavesdropping on cable because of cable's party-line configuration. At present, since cable systems make all signals available at all subscriber locations, a professional eavesdropper might be able to monitor the viewing preferences of a whole town from one central tap. To listen in on the telephone, he at least must tap a separate line for each conversation.

There is another side to the coin, however. A wiretapper has no trouble understanding voice conversations, but data on cable systems will flow as electrical pulses modulated on a carrier wave. Pulses from several thousand households may mingle into a single data stream. Consequently, in addition to monitoring the data channel, a cabletapper would have to know the precise coding employed in order to extract usable information. The cable operator, at his receiving point, will spend many thousands of dollars for equipment to decode subscriber data. Presumably, the cabletapper would have to do the same.

Subscribers do need protection, of course, because privacy invaders could include the cable operator himself and government agents using the operator's facilities. Privacy protection can include technical safeguards, legal restraints, and operator incentives to report cabletapping attempts. Technically, subscriber data can be protected by transmitting them at nonstandard frequencies, coding or scrambling them, or switching them only to authorized users. Each additional safeguard costs more money, but a determined eavesdropper can defeat any or all of them. Technical safeguards only raise the threshold of cost and effort required to listen in. Still, users of a particular cable service should be allowed to decide what technical safeguards they are willing to pay for. Hospital medical records may warrant more protection than do student records in schools, for example.

Legal restraints include extending laws against eavesdropping and message tampering to cover cable services. They also include continued citizen action against government surveillance, and efforts to establish privacy as a constitutionally protected human right.

Finally, the community can create incentives for the cable operator to report
and correct every violation of privacy that may occur. Perhaps a local ordinance might require him to file notice of all reported or suspected eavesdropping to the local franchising authority, the state regulatory commission, and the FCC, as well as to the person allegedly tapped. Under the local ordinance, the operator might be held liable for both civil damages and criminal penalties if he failed to report suspected incidents.

How much effort to direct against cabledropping is really part of a more general question: how much privacy people want and are willing to pay for. Short of a malign government seeking to impose 1984-like surveillance on individuals, some balance must be sought among privacy, ease of use, and cost. To achieve it, the issue should be viewed in the context of privacy on the telephone, in the mails, and in other modes of information exchange.

REGIONAL AND NATIONAL INTERCONNECTION

Cable television is only one part of a revolution in communications technology that includes communication satellites, video cassettes, and computers. These developments may in time be tied together to create what some have called “the wired nation.” Interconnecting cable systems within a region or throughout the nation can form new networks to carry specialized programming such as opera, soccer games, and bridge lessons. This programming could be shown on separate videotapes or cassettes from each cable headend, but it may be easier and cheaper to distribute the same program to many systems by satellite or microwave relay. When cable’s two-way capability becomes reality, interconnected systems also may compete with the telephone network for long-distance data communications.

Regional and national interconnection will come about when large home audiences for specialized programming or enough business users can be assembled. Hughes Aircraft Corporation has already proposed to link more than 100 cable systems by communication satellite by 1975, providing them with eight new channels of programming. The likelihood of satellite networking should spur communities to consider their interconnection requirements during cable franchising proceedings.
CABLE AS A COMMON CARRIER

Under the terms of their FCC licenses, broadcast television stations must exercise full control of their programming. They must insure that no libelous or obscene material is carried over the air and that all sides of controversial issues are presented. By contrast, the telephone industry bears no responsibility for messages sent over its facilities. As a "common carrier," it is legally required to accept messages on a first-come, first-served basis.

Cable television systems today fit somewhere in the middle. According to the FCC rules, cable systems must lease unused channel capacity on a first-come, nondiscriminatory basis. Yet the same rules require that cable systems with more than 3500 subscribers originate programming and accept the broadcaster's responsibilities in the areas of libel, obscenity, and fairness.

Many have suggested that cable television be regulated fully as a common carrier. The cable system owner would be prohibited from originating programming or controlling use of any channel, in order to promote the greatest diversity in programming and services. Without common carrier status, proponents argue, the cable operator may discourage programming or new services that compete with his own offerings. If the operator offered a pay-TV channel, for example, he might try to prevent others from leasing channels in the same time period in order to maximize his own audience.

The cable industry generally believes that common carrier regulation would be unwise, or at the very least premature. They argue that common carrier status might lead to public utility or "rate of return" regulation, in which a "fair" return on the capital invested in the system is set by a government agency. At this early stage in cable development, they contend, such limitation on potential profits would deny cable systems the venture capital they need for new construction in the major markets.

The common carrier issue will be resolved at the state, or more probably at the national level. Within the federal government, a Cabinet-level committee chaired by the Director of the Office of Telecommunications Policy reportedly favors common carrier regulation of cable television. Enactment of legislation to accomplish this is at least several years away, however. The possibility of cable television regulation under state public utility commissions is of more immediate concern to most communities.

Full public utility regulation seems likely if and when cable television becomes a community necessity like water, power, and the telephone. This would require

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cable companies to divorce themselves from film producers and other program suppliers, in order to promote a competitive market for cable programming. On the other hand, common carrier status should eliminate the need for cable cross-ownership restrictions against broadcasters, newspapers, and other distributors of information.

THE LONG-RANGE EFFECTS OF CABLE COMMUNICATIONS

It is my sincere belief that full utilization of broadband cable networking, with terminals located in individual dwellings, each terminal having high-speed time-shared input/output and interactive potential, is possibly the most significant and universally potent opportunity for good that will be offered to our civilization in our lifetime. It rivals in significance the printing press, electricity, instantaneous transmission of intelligence and high-speed transportation, in terms of human benefit, comfort and well-being.

Hubert J. Schlafly
Executive Vice President
TelePrompTer Corporation, 1972

Our inventions are wont to be pretty toys, which distract our attention from serious things. They are but improved means to an unimproved end, an end which was already but too easy to arrive at. We are in great haste to construct a magnetic telegraph from Maine to Texas; but Maine and Texas, it may be, have nothing important to communicate.

Henry David Thoreau, 1849

In spite of all the controversy surrounding the subject, we still know relatively little about the effects of broadcast television on individuals and society. We have thought even less about the long-range societal effects of cable television programming or other services that cable may bring. According to a 1972 report to the U.S. Surgeon General on television and social behavior, sixth-graders now watch, on the average, more than thirty hours of television each week. How will their viewing habits change if cable adds two new children’s channels? What are the likely psychological and social effects—good and bad—of such changes in television watching by children, or by adults? These are far from trivial questions, and there are others.
How would pushbutton voting via a two-way cable system affect the political process? Do we really want immediate, quite possibly impulsive, electronic referenda on sensitive local and national issues, instead of our present inefficient but more deliberate procedures? Could public access inspire too much localism and create new, electronic barriers as ethnic and racial neighborhoods become absorbed with their own affairs? Might the notion of community be lost in a Babel of diverse voices?

Few people are concerned with such questions as yet. Most individuals and groups who have studied cable television conclude that its growth will serve the public interest. This Handbook shares that basic optimism. But we should try to think ahead as we go about making the necessary and unavoidable short-term decisions that will shape cable's future growth and development. Some of these decisions will have long-lasting, unforeseen, and possibly unintended consequences.

By far the most important thing is that we make the decisions—"we" meaning everyone in the community. If we default, through apathy or ignorance, plenty of other people will be only too willing to make the decisions for us—government regulators, large corporations, and special interest groups. Their version of a "revolution in communications" could cause us to yearn nostalgically for the good old days of rabbit ears and snow.
Appendix A

THE 100 LARGEST U.S. TELEVISION MARKETS

(a) First 50 major television markets

1. New York, N.Y.--Linden-Paterson, N.J.
2. Los Angeles-San Bernardino-Fontana, Calif.
3. Chicago, III.
5. Detroit, Mich.
7. San Francisco-Oakland-San Jose, Calif.
9. Washington, D.C.
11. St. Louis, Mo.
12. Dallas-Fort Worth, Tex.
14. Baltimore, Md.
15. Houston, Tex.
16. Indianapolis-Bloomington, Ind.
17. Cincinnati, Ohio-Newport, Ky.
18. Atlanta, Ga.
19. Hartford-New Haven, Conn.-Waterbury, Conn.
22. Kansas City, Mo.
23. Milwaukee, Wis.
24. Buffalo, N.Y.
26. Memphis, Tenn.
27. Columbus, Ohio.
28. Tampa-St. Petersburg, Fla.
29. Portland, Ore.
30. Nashville, Tenn.
32. Denver, Colo.
34. Albany-Schenectady-Troy, N.Y.
35. Syracuse, N.Y.
38. Louisville, Ky.
39. Oklahoma City, Okla.
40. Birmingham, Ala.
41. Dayton-Riverside, Ohio.
42. Charlotte, N.C.
43. Phoenix-Mesa, Ariz.
45. San Antonio, Tex.
47. Greensboro-High Point-Winston-Salem, N.C.
48. Salt Lake City, Utah.
49. Wilkes-Barre-Scranton, Pa.
50. Little Rock, Ark.

(b) Second 50 major television markets

51. San Diego-Carlsbad.
52. Toledo, Ohio.
53. Omaha, Neb.
54. Tulsa, Okla.
55. Orlando-Daytona Beach, Fla.
56. Rochester, N.Y.
(28) Texarkana, Tex.-Shreveport, La.
(29) Mobile, Ala.-Pensacola, Fla.
(30) Davenport, Iowa-Rock Island-Moline, Ill.
(31) Flint-Bay City-Saginaw, Mich.
(32) Grand Island, Wis.
(33) Richmond-Petersburg, Va.
(34) Springfield - Decatur - Champaign-Earlington, Ill.
(35) Cedar Rapids-Waterloo, Iowa.
(36) Des Moines-Ames, Iowa.
(37) Wichita-Hutchinson, Kan.
(38) Jacksonville, Fla.
(39) Cape Girardeau, Mo.-Paducah, Ky.-Harrisburg, Ill.
(40) Roanoke-Lynchburg, Va.
(41) Knoxville, Tenn.
(42) Fresno, Calif.
(43) Raleigh-Durham, N.C.
(44) Johnstown-Altoona, Pa.
(45) Portland-Peoria, Maine.
(46) Spokane, Wash.
(47) Jackson, Miss.
(48) Chattanooga, Tenn.
(49) Youngstown, Ohio.
(50) South Bend-Elkhart, Ind.
(51) Albuquerque, N. Mex.
(52) Port Wayne-Warren, Ind.
(53) Peoria, Ill.
(54) Greenville - Washington - New Bern, N.C.
(55) Sioux Falls-Mitchell, S. Dak.
(56) Evansville, Ind.
(57) Baton Rouge, La.
(58) Beaumont-Port Arthur, Tex.
(59) Duluth-Superior, Minn.
(60) Wheeling, W. Va.-Steubenville, Ohio.
(61) Lincoln-Hastings-Kearney, Neb.
(63) Madison, Wis.
(64) Columbus, Ga.
(65) Amarillo, Tex.
(66) Huntsville-Decatur, Ala.
(67) Rockford-Freeport, Ill.
(68) Fargo-Grand Forks-Valley City, N. Dak.
(69) Monroe, La.-El Dorado, Ark.
(70) Columbia, S.C.

Source: FCC Cable Television Report and Order, issued February 2, 1972. Markets are determined from American Research Bureau data and ranked by number of prime-time viewers.
### Appendix B

THE 50 LARGEST U.S. CABLE TELEVISION SYSTEMS

<table>
<thead>
<tr>
<th>City</th>
<th>Number of Subscribers</th>
<th>MSO Ownership</th>
<th>Percent MSO-Owned</th>
</tr>
</thead>
<tbody>
<tr>
<td>San Diego, Calif.</td>
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<td>Cox American*</td>
<td>100%</td>
</tr>
<tr>
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</tr>
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<td>Time-Life</td>
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<tr>
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<td>43,501</td>
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<tr>
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<th>Number of Subscribers</th>
<th>MSO Ownership</th>
<th>Percent MSO-Owned</th>
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<td>42 Parkersburg, W. Va.</td>
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<td>44 Florence, Ala.</td>
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<td>Teleprompter</td>
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The merger of Cox Cable Communications, Inc., and American Television & Communications Corporation to form Cox American has been approved by stockholders of both companies but not yet completed, because of antitrust objections brought by the U.S. Department of Justice.
Appendix C

FINANCIAL MODELS OF THREE CABLE TELEVISION SYSTEMS

This Appendix contains ten-year financial results for the three cable systems described in Chap. 3, along with the assumptions used to generate them. The results are derived using a cable system cash flow model developed at The Rand Corporation.* Sensitivity of the computed rates of return to subscriber saturation level and other key assumptions is also discussed.

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<th>3</th>
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<td>50%</td>
<td>50%</td>
<td>50%</td>
<td>50%</td>
<td>50%</td>
<td>50%</td>
<td>50%</td>
<td>50%</td>
<td>50%</td>
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<td>100%</td>
<td>100%</td>
<td>100%</td>
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<td>100%</td>
<td>100%</td>
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</table>

REVENUE (THOUSANDS)
<p>| FIRST OUTLET 149.2 | 235.4 | 278.8 | 288.0 | 316.8 | 316.8 | 316.8 | 316.8 | 316.8 | 316.8 | 359.2 |
| SECOND OUTLET 14.1 | 7.0 | 18.1 | 10.7 | 11.3 | 21.9 | 25.9 | 25.9 | 25.9 | 25.9 | 18.8 |
| NEW INSTALLATION 14.1 | 18.1 | 12.0 | 4.0 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 |
| RECONNECTS 0.1 | 14 | 24 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| ADVERTISING 0.2 | 1.4 | 2.4 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| PAY TV 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| CHANNEL LEASING 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| TOTAL 41.0 | 178.8 | 266.2 | 305.2 | 312.7 | 350.8 | 350.8 | 350.8 | 350.8 | 350.8 | 2858.8 |</p>
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<p>| DEBT/EQUITY RATIO | 0.01 |
| OPERATING EXPENSES TO REVENUES RATIO | 4.74 | 1.37 | 0.96 | 0.72 | 0.61 | 0.57 | 0.57 | 0.50 | 0.00 | 0.61 | 0.56 |</p>
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<td>Cost per mile of underground trunk and feeder plane</td>
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<td>Cost of tools and test equipment per mile of plant</td>
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<td>Monthly charge for each multiple outlet</td>
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<td>Percent of subscribers with second outlet</td>
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<td>Installation charge</td>
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<td>Reconnection charge</td>
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<td>Annual advertising revenue per subscriber</td>
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<td>Pay-TV revenue per subscriber</td>
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<tr>
<td>Percent of subscribers who move away each year</td>
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<td>100%</td>
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<td>Percent of subscribers who disconnect and reconnect each year</td>
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<td>Number of new installations an installer can make daily</td>
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<tr>
<td>Number of disconnects or reconnects an installer or service technician can make daily</td>
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<td>Number of subscribers a bookkeeper can service</td>
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<td>Miles of plant a maintenance technician can service</td>
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<td>Yearly increase in salaries due to inflation and merit raises</td>
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<tr>
<td>Telephone cost per year for central facility</td>
<td>$1,800</td>
<td>$4,500</td>
</tr>
<tr>
<td>Telephone cost per year for each area facility</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Yearly billing cost per subscriber (excluding labor)</td>
<td>$1.08</td>
<td>$1.08</td>
</tr>
<tr>
<td>Fixed cost per year of association dues and journals</td>
<td>$500</td>
<td>$800</td>
</tr>
<tr>
<td>Additional cost per subscriber for dues and journals</td>
<td>$0.05</td>
<td>$0.05</td>
</tr>
<tr>
<td>Fixed cost per year of travel and entertainment</td>
<td>$1,500</td>
<td>$1,500</td>
</tr>
<tr>
<td>Additional cost per subscriber for travel and entertainement</td>
<td>$0.05</td>
<td>$0.05</td>
</tr>
<tr>
<td>Fixed cost per year for professional services</td>
<td>$2,000</td>
<td>$3,000</td>
</tr>
<tr>
<td>Additional cost per subscriber for professional services</td>
<td>$0.05</td>
<td>$0.10</td>
</tr>
<tr>
<td>Property tax rate</td>
<td>2%</td>
<td>2%</td>
</tr>
<tr>
<td>Franchise fee as a fraction of revenue</td>
<td>3%</td>
<td>3%</td>
</tr>
<tr>
<td>Bad debts as a fraction of revenue</td>
<td>1%</td>
<td>1.5%</td>
</tr>
<tr>
<td>FCC fees per year per subscriber</td>
<td>$0.30</td>
<td>$0.30</td>
</tr>
<tr>
<td>Copyright payments as fraction of revenue</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Advertising and sales cost per new customer or reconnect</td>
<td>$5</td>
<td>$5</td>
</tr>
<tr>
<td>Advertising and sales cost per household in service area</td>
<td>$0.50</td>
<td>$0.50</td>
</tr>
<tr>
<td>Number of imported signals</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Local origination cost per hour (excluding salaries)</td>
<td>$10</td>
<td>$10</td>
</tr>
<tr>
<td>Hours per week of local origination</td>
<td>15</td>
<td>30</td>
</tr>
<tr>
<td>Interest rate on outstanding debt</td>
<td>8%</td>
<td>8%</td>
</tr>
<tr>
<td>Depreciation period in years</td>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td>Debt to equity ratio</td>
<td>1/1</td>
<td>1/1</td>
</tr>
<tr>
<td>Receivables as a fraction of revenue</td>
<td>8%</td>
<td>8%</td>
</tr>
<tr>
<td>Payables as a fraction of operating expense</td>
<td>8%</td>
<td>8%</td>
</tr>
</tbody>
</table>

System C has 40 hours origination from central studio; 35 hours from each area studio.
Rates of Return

One often-used financial measure is the rate of return on capital. For stable, operating businesses this is calculated as the after-tax operating net profit expressed as a percentage of capital invested in the business. In a new venture such as a cable television system, however, investors hope to profit from gains in the value of their equity (stock) as well as from operating earnings. Thus, the rate of return on total capital is the interest rate which, applied to the initial equity and debt investment(s) and compounded annually (taking into account interest and dividend payments), would yield the present market value of the system.

Using an industry rule-of-thumb, market values for cable systems A, B, and C are assumed equal to ten times system operating income. Under the "base case" assumptions detailed above, the rates of return on total capital after five years of operation are 22 percent, 14 percent, and 4 percent, respectively. Similarly, the rates of return calculated using different assumptions are compared in Table 19. Investor rate of return is clearly very sensitive to the saturation level achieved.

Communities will find it helpful to test the financial consequences of policy decisions involving rate structures, franchise tax levels, the extent of local origination, and additional capital expenditures required of the cable system.

<table>
<thead>
<tr>
<th>Table 19</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANNUAL RATE OF RETURN ON TOTAL CAPITAL</td>
</tr>
<tr>
<td>(Using System Value After Fifth Year)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Assumption</th>
<th>System A</th>
<th>System B</th>
<th>System C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base case</td>
<td>22%</td>
<td>14%</td>
<td>4%</td>
</tr>
<tr>
<td>10% lower subscriber saturation</td>
<td>10%</td>
<td>-3%</td>
<td>-10%</td>
</tr>
<tr>
<td>10% higher subscriber saturation</td>
<td>29%</td>
<td>24%</td>
<td>16%</td>
</tr>
<tr>
<td>20% underground construction</td>
<td>18%</td>
<td>10%</td>
<td>-4%</td>
</tr>
<tr>
<td>5% franchise fee</td>
<td>21%</td>
<td>13%</td>
<td>2%</td>
</tr>
<tr>
<td>5% inflation factor</td>
<td>20%</td>
<td>12%</td>
<td>0%</td>
</tr>
</tbody>
</table>
Appendix D

GLOSSARY*

Access Channels — The three channels that the FCC rules require cable systems in the major markets to reserve for local uses—one each for education, local government, and public access. The education and government channels must be made available free of charge for at least five years. The free public access channel must be reserved indefinitely.

AM (Amplitude Modulation) — A transmission technique in which the information to be transmitted is used to change the signal level (amplitude) of a carrier signal.

Amplifier — A device that boosts the strength of an electronic signal. Amplifiers are spaced at intervals throughout a cable system to rebuild the strength of television signals which weaken (attenuate) as they pass through the cable network. A bridger amplifier transmits signals from the trunk cable into each feeder cable, providing appropriate electrical isolation to prevent interference. A line extender amplifies signals in the feeder cable.

Antenna — A device used to transmit or receive broadcast signals.

Attenuation — Loss in television signal strength as it travels through the cable.

Bandwidth — The difference between the lowest and highest frequency components that can be carried by a telecommunications system, measured in cycles per

* Many of these definitions are taken by permission from A Glossary of Cable Terms. Cable Television Information Center, Washington, D.C., October 1972.
second or hertz (abbreviated Hz). For instance, voice transmission by telephone requires a bandwidth of about 3000 cycles per second (3 KHz). A TV channel occupies a bandwidth of 6 million cycles per second (6 MHz). Cable systems today utilize bandwidths up to about 250 MHz, usually from 50 to 300 MHz.

**Broadband** (or Wideband) System — A communication system with a relatively high bandwidth. A broadband communication system can carry television signals and many other services.

**Broadcasting** — Transmission of electromagnetic signals through the air, usually beamed in all directions over a broad geographic area.

**Cablecasting** — Programming exclusive of broadcast signals carried on a cable television system; includes local origination by the cable operator and access programming.

**Cable Television** (or **Cable Communications**) — A communication system that distributes broadcast television signals, original programs, and other services by means of coaxial cable.

**CARS** (or **Cable Television Relay Service**) — An acronym for **Community Antenna Relay Service**; an FCC-authorized microwave frequency band for relaying television signals to cable TV systems.

**CATV** — Community Antenna Television, an early and still popular acronym for what is now better described by the term **cable television**.

**Certificate of Compliance** — The approval of the FCC that a cable system must obtain before it can carry broadcast television signals.

**Certification of Performance** — A formal test of the cable system at the completion of each construction phase to ensure satisfactory operation and compliance with the terms of the franchise.

**Channel** — In television, a section of the electromagnetic spectrum 6 MHz (megahertz) wide, which carries a television signal.

**Closed Circuit TV** — A television system in which the receiving and originating equipment are directly linked by cable, microwave, or telephone lines, without
broadcasting through the air. Usually applied to a television system used by a single organization.

Coaxial Cable — Copper or copper-sheathed aluminum wire surrounded by an insulating layer of polyethylene foam, then by an outer conductor composed of tiny strands of braided copper wire or a seamless aluminum sheath, and finally by a protective outer jacket. By almost eliminating the generation of electromagnetic fields outside the cable, this construction reduces attenuation and gives cable its great signal-carrying capacity.

Common Carrier — Any entity that provides communication services to the general public at nondiscriminatory rates, and without control of message content (e.g., telephone companies).

Converter — A device that changes a nonstandard frequency channel (e.g., one above 216 MHz) to a standard VHF channel, enabling it to be tuned directly on the television set. Cable systems install converters when more than 12 channels are distributed on a single cable. Converters also prevent interference from strong over-the-air signals.

Cross-Ownership — Ownership of two or more kinds of communication outlets by the same individual or business. The FCC prohibits television stations and telephone companies from owning cable systems in their service areas. Television networks are prohibited from owning cable systems anywhere in the United States.

Digital Signals — Information transmitted in discrete pulses rather than as continuous signals. Digital signals on a cable television system would be used principally to transmit data and messages, not television programs.

Direct Interference (or On-Channel Interference) — A ghost image produced on a TV screen because the signal transmitted through the cable arrives slightly later than the signal received off the air.

Distant Signals (or Imported Signals) — TV signals that originate at a point too far away to be picked up by ordinary home reception equipment. Cable systems are limited by FCC rules in the number of distant signals they can offer subscribers.

Drop Cable — The coaxial cable that connects each building or home to the feeder line of the cable network.
Dual Cable — Two cables installed side by side to carry different signals, thus doubling channel capacity.

Exclusivity — A provision in a commercial television contract that grants exclusive playback rights for a film or other program to a broadcast station in the market it serves. Under the FCC's rules, cable operators cannot carry distant signals that would violate local television stations' exclusivity agreements.

FCC — The Federal Communications Commission, the agency of the federal government that has authority to regulate cable television and other electronic communications.

Feeder Cables (or Feeder Lines) — Cable distribution lines that connect the main trunk line to the smaller house drops that lead into residences.

Filter — An electronic component that passes desired frequencies and rejects others. Filters are used in cable trunk and feeder lines for two-way or other special services.

FM (Frequency Modulation) — A transmission technique in which the information to be transmitted is used to change the frequency of a carrier signal.

Frame Stopping Terminal (also Frame Grabber, or Single Frame Terminal) — A device connected to a TV set that enables viewing of a still picture or a single frame of information instead of a motion video picture.

Franchise — A contractual agreement between a city (or county) and a cable TV system operator, defining the conditions under which the operator can install and operate a system.

Franchising Authority (or Franchisor) — Governmental body responsible for specifying terms of a franchise, awarding it, and regulating the franchise holder (franchisee).

Ghost Image — A double or multiple image on a TV screen caused by two or more signals arriving at slightly different times (e.g., because of signal reflections from tall buildings). (See Direct Interference.)
**Grandfathering** — Exempting a cable system from the federal rules regarding system and franchising requirements if it was in existence prior to March 31, 1972, is presently in operation, and serves 50 or more subscribers. The system must comply with the rules, however, within 5 years from that date or at the expiration of its current franchise, whichever occurs first.

**Hardware** — The equipment involved in production, storage, distribution, or reception of electronic signals. In cable television it means the headend, the coaxial cable network, the television receiver, and such production equipment as cameras and videotape recorders.

**Headend** — The electronic control center of a cable television system—generally located at the antenna site. The headend includes preamplifiers, frequency converters, demodulators, modulators, and other related equipment that amplify, filter, and convert incoming broadcast TV signals for distribution over the cable system.

**Hertz (Hz)** — A measure of frequency, equivalent to cycles per second (cps). One Hz equals 1 cps; one KiloHertz (KHz) equals 1000 Hz; one Megahertz (MHz) equals 1,000,000 Hz.

**Hub** — One of two or more interconnected headends that may be needed to provide cable service over a wide area.

**Independent Station** — A commercial TV station that generally carries, in prime time, not more than 10 hours of programming per week offered by the three major national TV networks.

**Interconnection** — Linkage of cable television headends by microwave or cable so that subscribers in different areas can see the same programming simultaneously.

**ITFS (Instructional Television Fixed Service)** — A special microwave frequency band allocated for over-the-air transmission of instructional television.

**Leapfrogging** — Cable operators’ practice of skipping over a nearby TV station to bring in a farther signal that is more popular or provides more program diversity. The FCC rules limit leapfrogging by establishing priorities for carrying stations that lie outside the cable system’s service area.
Local Origination — Programs originated by the cable operator.

Major Market (or Top-100 Market) — One of the 100 largest television broadcast areas, ranked by the number of viewers. (See Appendix A for a list of these markets.)

Microwave Relay — Point-to-point, over-the-air transmission of signals at high frequency. Many cable systems receive some television signals from distant locations by microwave relay.

Multiple-System Operator (MSO) — A company that owns more than one cable television system.

Networking — Interconnection of a number of cable systems to permit simultaneous reception of the same program.

Nonbroadcast services — Cable communication services other than redistribution of broadcast TV programs.

Pay TV — A system of television in which subscribers pay for special programs or for access to a special channel. Pay-cable refers to pay TV on cable television, with subscribers paying an extra fee (over and above the regular monthly charges) to watch events such as first-run movies, sports programs, or educational courses.

Penetration (or Saturation) — The ratio of the number of subscribers to the total number of households passed by the cable system. Penetration in large part determines a system’s profitability.

Pole Rights — An agreement between a cable television system and a power or telephone utility permitting the cable system to install coaxial cable on existing utility poles.

Polling — A technique used in two-way response services. A computer signals each subscriber’s terminal in turn, via a special downstream channel, to send any messages he has upstream.

Prime Time — The evening hours during which television audiences are largest. Defined by the FCC in the cable regulations to be 6:00 to 11:00 p.m. in the Eastern and Pacific time zones and 5:00 to 10:00 p.m. in the Central time zone. In
the Mountain time zone, each station shall select whether the period shall be 6:00 to 11:00 p.m. or 5:00 to 10:00 p.m.

Public Access — Uncensored access by the general public to speak or present program materials on cable television. The FCC rules require systems in the top 100 markets to set aside one free channel for public access on a first-come, first-served basis.

Rate of Return Regulation — Regulation by which a government agency sets the amount of profit a company can earn as a percentage of the capital invested in the business. Telephone, electric power, and other utilities are regulated in this way.

RFP (Request for Proposals) — Document issued by a franchising authority for use by applicants competing for the franchise award. It states the proposed terms of the final franchise, and requests applicants to state their qualifications and proposals concerning any provisions left open in the franchise.

Shadow Trunk — A trunk cable installed for later activation, not furnished with amplifiers and other accessories.

Software — Programming and programming materials such as films, videotapes, and slides. Also, the computer programming required for two-way and other services.

Special Showing — Arguments and substantiating evidence required of the cable operator and franchising authority in cases where local franchise terms depart from the FCC rules.

Strand (or Messenger Cable) — A steel cable used for mechanical support of the coaxial communication cable.

Subdistricting (or Internal Interconnection) — The provision of a number of interconnected districts within a franchise area, each of which can originate or receive separate programming.

Supertrunk — Large-diameter coaxial cable used in cable interconnection to reduce attenuation and signal degradation.

Tap — The connection from the feeder cable to the subscriber drop cable.
Television Translator — A type of relay system that picks up signals from distant television stations, converts the signals to another channel to avoid interference, and retransmits them into areas the original signals could not have reached.

Trunk Cable — The major distribution cable used in cable television systems. Feeder cables branch out from the trunks.

Tuner — A device that selects the desired signal from a group of signals.

Two-Way (or Bidirectional) System — A cable television system that can carry signals in two directions, both downstream from the headend to subscribers' homes and upstream from subscribers to the headend. The FCC rules require new cable systems in the major markets to have the capacity for two-way data communications.

UHF (Ultra-High Frequency) — The frequency band from 300 to 3000 MHz. It includes TV channels 14-83 (470-890 MHz).

VHF (Very High Frequency) — The frequency band from 30 to 300 MHz. It includes TV channels 2-6 (low VHF, 54-88 MHz) and Channels 7-13 (high VHF, 174-216 MHz).

Videotape Recorder (VTR) — A device that can record visual and audio information on magnetic tape for storage and later playback. The magnetic tape or videotape is sold in reels or cassettes in one-half, three-quarter, one-, and two-inch widths. Videotape can be erased and rerecorded.
FOR MORE INFORMATION

This is a list of books, reports, and journals relevant to local decisionmaking about cable television. It is not intended to be a complete bibliography. The companion reports to this Handbook are listed inside the front cover.

CURRENT INFORMATION

Because the field changes so rapidly, much of the published literature on cable television becomes dated within a few months. The best sources of current information are:

CABLE TELEVISION INFORMATION CENTER
2100 M Street, N.W.
Washington, D.C. 20037

Provides information primarily to local government officials. However, the Center's reports are available to all. They include:

A Suggested Procedure ($2.00)
A Guide to Federal Regulation ($3.00)
Cable Economics ($3.00)
How to Plan an Ordinance ($5.00)
Cable: An Overview ($2.00)
Bibliocable ($1.00)
A Glossary of Cable Terms ($5.00)
Cable Data ($50)
FCC Rules and Reconsideration ($40)

The complete series, future reports, and updating service can be purchased for $25.00.
NATIONAL LEAGUE OF CITIES
1612 K Street, N.W.
Washington, D.C. 20036
Assists local officials through its Office of Urban Services.

UNITED CHURCH OF CHRIST
Office of Communication
289 Park Avenue South
New York, New York 10010
A leading force in support of citizen involvement in cable television. Community
groups can write for a free copy of the Office's excellent introduction, A Short

NATIONAL CABLE TELEVISION ASSOCIATION
918 16th Street, N.W.
Washington, D.C. 20006
The NCTA, an industry group, issues reports to its membership on cable issues.
The NCTA Bulletin, published every other week, is available to nonmembers
for $24 a year.

Newsletters and trade magazines have the most current information and news.
They include:

Black Communicator
Urban Communications Group
1730 M Street, N.W.
Washington, D.C. 20036
(monthly: $5 yr for individuals;
$25 yr for libraries and organizations)
Newsletter emphasizing minority participation in communications.

Broadcasting
1735 De Sales Street, N.W.
Washington, D.C. 20036
(weekly: $30 yr)
Covers both broadcasting and cable, with emphasis on FCC matters. An annual
CATV Sourcebook is also available for $8.50.

Broadcast Management/Engineering
820 Second Avenue
New York, New York 10017
(monthly: $15 yr)
Emphasizes technical articles.
Broadband Communications Report
274 Madison Avenue
New York, New York 10016
(bimonthly, $48/yr)

Newsletter emphasizing nonbroadcast services on cable.

Cablecasting
140 Main Street
Ridgefield, Connecticut 06877
(bimonthly, $8/yr)

Journal oriented toward cable engineering.

Cable Information
475 Riverside Drive
New York, New York 10027
(monthly, $10/yr)

Newsletter from the Broadcasting and Film Commission, National Council of Churches, emphasizing public access and other noncommercial developments.

CATV
1900 W. Yale
Englewood, Colorado 80110
(weekly, $33/yr)

Comprehensive coverage of cable developments. The annual CATV Systems Directory ($8.95) and CATV Directory of Equipment and Services ($6.95) are free with a CATV subscription.

TV Communications
1900 W. Yale
Englewood, Colorado 80110
(monthly, $10/yr)

Contains more in-depth articles on cable than do other journals listed.

Television Digest
2025 Eye Street, N.W.
Washington, D.C. 20006
(weekly, $35/yr)

Weekly newsletter on regulatory and industry matters. The TV Factbook, Services Volume ($35), published annually by Television Digest, is the best source of reference data on operating cable systems.
Urban Telecommunications Forum
276 Riverside Drive
New York, New York 10025

Tri-monthly. $12/yr for individuals, $17 for libraries and organizations.

Newsletter emphasizing nonbroadcast services on cable.

Variety
154 W. 46 Street
New York, New York 10036

Weekly. $25/yr.

Particularly good coverage of pay TV developments.

BACKGROUND AND GENERAL REFERENCES


A cartoon-illustrated primer. Single copies are available free from the National Film Board of Canada, P. O. Box 6100, Montreal 101, Quebec.


Presents a persuasive case for citizen involvement in local decision-making. Copies are available from the Office of Communication, United Church of Christ.

Charles Tate (ed.), Cable Television in the Cities: Community Control, Public Access, and Minority Ownership, The Urban Institute, 1971, 184 pp. ($3.95).

Besides covering the topics in its title, the book contains a detailed list of organizations that can offer information and assistance to minority and other citizen groups. Available from The Urban Institute, 2100 M Street, N.W., Washington, D.C. 20037.


The product of a year-long study, the Sloan Commission report contains excellent background material. However, its recommendations are aimed more at federal and state policies than local decisionmaking. It can be purchased in commercial bookstores.

Described by the editors as "a counter source of views" to the Sloan Commission report, this issue emphasizes the problems posed by commercial cable development. Available from Yale Law School, Box 87, New Haven, Connecticut 06520.


Originally published in shorter form in The Nation, May 18, 1970, this still is one of the best introductions to cable television. Available in commercial bookstores.


Available from the Cable Television Information Center.

STUDIES FOR SPECIFIC CITIES

Studies of cable television in other cities can help communities in their own planning and franchising. Recent studies include:

Cable TV Study Committee, Cable Television in Detroit, May 1972, 162 pp. ($5.00), available from the City Clerk’s Office, 1304 City-County Building, Detroit, Michigan 48226.

Recommend ownership by a public authority.

Leland L. Johnson et al., Cable Communications in the Dayton Miami Valley: Basic Report, The Rand Corporation, R-943-KF/FF, January 1972, 536 pp. ($5.00); Summary Report, R-942-KF/FF, January 1972, 56 pp. ($3.00).

Describes a multiple hub system for the metropolitan area. Several ownership options are outlined.


Describes a highly advanced cable system for Washington, D.C. (but of questionable economic feasibility in the near term without external subsidy). The study suggests ownership by "a public interest authority or a quasi-public interest corporation."

FRANCHISING

Model franchises written before publication of the 1972 FCC rules are now largely out of date. Recent references include:
Cable Television Information Center, How to Plan an Ordinance, October 1972, 85 pp. ($5.00).

Draws on a wide range of existing franchises to show alternative ways of drafting terms and conditions.


Available from the League, 1106 "O" Street, Sacramento, California 95814.

Center for the Analysis of Public Issues, Crossed Wires: Cable Television in New Jersey, July 1971, 94 pp. ($5.00).

An account of past problems and abuses of cable franchising in a single state. It is available from the Center, 92A Nassau Street, Princeton, New Jersey 08540 ($5.00).

Local legal service agencies and "public interest" law firms may be able to assist citizen groups in dealing with cable systems, franchising authorities, and the FCC. A list of such firms is available from:

CENTER FOR LAW AND SOCIAL POLICY
1600 20th Street, N.W.
Washington, D.C. 20009

CABLE TECHNOLOGY


Appendix A to the Sloan Commission report.

Hubert Schlafly, Jr., The Real-World of Technological Evolution in Broadband Communications, 1971, available free from TelePrompter Corporation, 50 W. 44 Street, New York, New York 10036.


CABLE ECONOMICS


Presents a method for estimating the cost of underground construction and other capital and operating costs.


Discusses the economics of cable television in the Dayton area under several different sets of assumptions. Those with knowledge of business finance and access to computing facilities can use the same financial model to obtain results for their communities. The documented computer program and a source program card deck written in FORTRAN-IV are available as Computer Code for a Cable Television System Financial Model, by R. E. Park, The Rand Corporation, R-1027-MF, April 1972 ($100.00).


Gives financial projections for several model cable systems under the impact of the (then proposed) new FCC rules. Single copies are available free from P. E. Davis, American Telephone and Telegraph Company, 125 Williams Street, New York, New York 10038.


Derives penetration estimates from the past experience of cable systems.


An investment oriented research report. Copies may be obtained from Equity Research Associates, 52 Wall Street, New York, New York 10005.

Cablecast, Paul Kagan Associates, 100 Merrick Road, Tower East-Suite 200, Rockville Centre, New York 11570.

An informative and readable bimonthly investment newsletter, available for $160 a year.

PUBLIC ACCESS

Straightforward and sensible explanation of the FCC rules for access. Single copies available free from NCTA, 918 16th Street, N.W., Washington, D.C. 20006.


A manual from the alternate video movement, emphasizing the use of portable videotape equipment. This is the sixth issue of Radical Software, a forum for information exchange among those involved in making videotapes. Four earlier issues are available for $10.95 from Raindance, 8 East 12th Street, New York, New York 10013.

H. Allan Frederiksen (Johnny Videotape), Community Access Video, 1972, 60 pp. ($3.00).

Another how-to manual from an alternate video activist. Available from Mr. Frederiksen, 695 30th Avenue, Apt. E, Santa Cruz, California 95060.

National Film Board of Canada, Challenge for Change newsletter (3 or 4 issues yearly).

Excellent newsletter describing Canadian experience with public access, which is generally more advanced than that in the United States. Available free from the Film Board, P. O. Box 6100, Montreal 101, Quebec.


Available free from the Fund for the City of New York, 1133 Avenue of the Americas, Suite 2920, New York, New York 10036.


Presents three interesting case studies of local origination prior to adoption of the 1972 FCC rules.

PUBLIC SERVICES ON CABLE


A good readable introduction, but written before the 1972 FCC rules, so some parts are out of date. Available from the NEA, 1201 16th Street, N.W., Washington, D.C. 20036. PubiCable, a consortium of educational and other noncommercial groups, is located at the same address and may have current information about noncommercial uses of cable.

A comprehensive evaluation of the literature, resulting in sixty conclusions on
the effective use of television in instruction. Available from the National Association
of Educational Broadcasters, 1346 Connecticut Avenue, N.W., Washington,
D.C. 20036.

Kas Kalba, Communicable Medicine: Cable Television and Health Services, report
prepared for the Sloan Commission on Cable Communications, September 1971.

A balanced treatment of short-term and long-term health service applications on
cable. Single copies may still be available from the Alfred P. Sloan Foundation,
630 Fifth Avenue, New York, New York 10020.

Committee on Telecommunications, Communications Technology for Urban Improve-

A description of more than 20 possible pilot projects—most involving cable—to
demonstrate public uses of telecommunications. Available as Publication No.
PB200-317 from the National Technical Information Service, U.S. Department of
Commerce, Springfield, Virginia 22151.

BIBLIOGRAPHIES

William Stroud, Selected Bibliography on Telecommunications (Cable Systems), May
1972, 38 pp. ($1.50).

Quite comprehensive. Available from the Wisconsin Library Association, 201 W.
Mifflin Street, Madison, Wisconsin.


Michael H. Molenda, "The Educational Implications of Cable Television (CATV) and Video